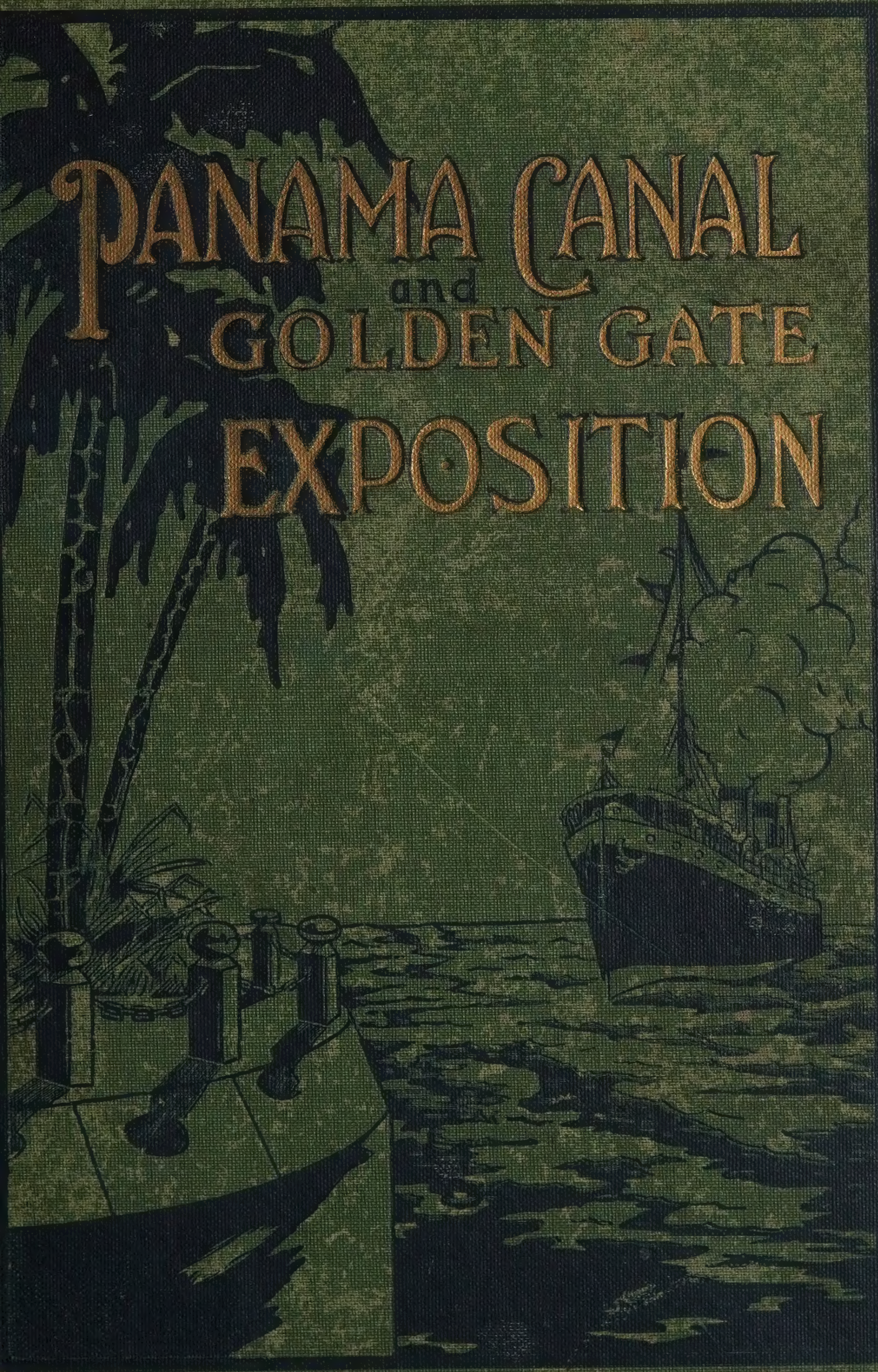
PANAMA CANAL and GOLDEN GATE EXPOSITION



Judith
Nicholson
Room 14

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COLONEL GEORGE WASHINGTON GOETHALS,

THE BUILDER OF THE PANAMA CANAL,

Who might be classed as the most absolute despot on earth, although a benevolent one, and the squarest boss a man ever worked for. He is a thorough engineer, a righteous judge, and a stern executioner rolled into one. He realizes that man is but human, and for simple infractions of the rules, is always ready to give the offender another chance, but there will be no second time. A man of prodigious memory, quick to grasp details be they trivial affairs of every day life, or questions of moment; an ear for every one, and the friend of all. The American Nation owes much to the men who rendered yeoman service on the Isthmus; they cannot be too highly rewarded. It owes much to that peerless leader, George Washington Goethals, who, for over six long years has kept the goal steadily in sight, who has never, for a single instant, permitted his determination to waver, who has fought inch by inch until every obstacle has been overcome, and who, through his forceful personality and sense of justice, has compelled the admiration of everyone with whom he has come in contact.

The Panama Canal

AND

Golden Gate Exposition

Authentic and Complete Story of the Building and
Operation of the Great Waterway—the
Eighth Wonder of the World.

With a Graphic Description of the

Panama-Pacific International Exposition

the Official Celebration of the Completion of America's Triumph
at Panama, the Gigantic Undertaking Successfully
Carried Out under the Supervision of
COL. GEORGE W. GOETHALS, U. S. A.

By RALPH EMMETT AVERY
TRAVELER, AUTHOR AND LECTURER

Edited by WILLIAM C. HASKINS
of THE CANAL RECORD

Profusely Illustrated With Photographs in Half-tone and Color.

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FOREWORD

THE eighth wonder of the world, the crowning achievement of man's greatest undertaking, is the construction of the Panama Canal by the Government of the United States and, since this stupendous work has been accomplished in much shorter time than was thought possible, there are necessarily many reasons for congratulations for the skill and perseverance displayed aside from the fact that in completing this enterprise our government has at the same time succeeded in changing the commercial highways of the world.

Doubtless for centuries to come the world-wonders of the Panama Canal will be told in story and in picture, but the eloquence of the theme itself will never be exhausted while reverence for mighty deeds finds lodgment in the hearts of men.

Recognizing as much as one man could the magnitude and importance of the work being performed on the Isthmus, the Author for almost two years dwelt among the activities of this gigantic enterprise, and in these pages authentically presents to the reader his chronicles of the step-by-step progress of the construction from beginning to completion, as well as the successful installation of the world's majestic waterway from ocean to ocean.

Clothed as it is in a beauty of typography and art illustrations in keeping with the grandeur of the subject he feels assured of a cordial reception on the part of the public of the result of his efforts.

THE AUTHOR.

SUNRISE, SUNSET AND MOONLIGHT SCENES ON PANAMA BAY.

During February and March the moon is particularly bright, due to the clear atmosphere which prevails in the height of the dry season. On certain brilliant evenings it is possible to read in the moonlight. The cloud effects are perfect and the rainbows magnificent. One of the prettiest effects, which happens but rarely, is a rainbow at night.

DISCOVERY AND SETTLEMENT

THE history of the Panama Canal begins with the search for a western waterway to the Indies, and for fame and gold, by those hardy adventurers who followed in the wake of Columbus. These men, fresh from the Moorish wars, and equipped for a struggle with Italy which did not come to pass, looked for new fields to conquer. Nothing suited them better than the discovery of a New World peopled by heathens waiting to be converted by the sword to the Christian faith, after their gold, of which they seemed to have plenty, was stripped from them to fill the empty coffers of Spain.

This search by the followers of Columbus was fairly successful, so far as fame and gold were concerned and, although no direct water route was found to the Indies to the west, it naturally led to the settlement of the Isthmus of Panama, the narrow strip of land separating the two great oceans and forming the connecting link between North and South America. The establishment of settlements on both coasts and the short distance between them, led to the building of crude roads and trails for the early mule trains. These trails led to the construction of a railroad, and the railroad to a ship canal, for trade follows settlers, and water is the natural highway between nations. The story of the Isthmus is, therefore, in a measure, the evolution of transportation routes.

EARLY DISCOVERERS

The first European to sail along the coast of Panama was Rodrigo de Bastidas, who sailed from Cadiz in October, 1500, and first touched the continent near the island of Trinidad, and from there went west as far as Nombre de Dios. With him on that voyage was Vasco Nuñez de Balboa, who, later, was to discover the great South Sea, and Juan de la Cosa, who had sailed with Columbus on his second voyage and was considered one of the most able mariners of his day.

Columbus sailed from Cadiz on his fourth and last voyage in search of a passageway to the Indies in May, 1502. On this voyage he skirted the shores of Honduras and Costa Rica, to Almirante Bay and Chiriqui Lagoon on the coast of Panama. At the latter place he was told by the Indians that, if he would continue his course to the east, he would soon come to a narrow place between the two seas, and this led him to believe that his search for a strait was nearing success; that he would soon pass into the Indian Ocean and thence around the Cape of Good Hope to Spain, surpassing the achievement of Vasco de Gama, the Portuguese, who had already sailed around Africa (1497-1498) in his search for a water route to the Indies. Columbus continued on his way and passed the site of the present city of Colon at the Atlantic entrance to the Canal, and on November 2, 1502, arrived at a harbor 18 miles northeast, which he named Porto Bello, signifying beautiful port. He stayed there a week stormbound, and then continued on past Nombre de Dios, thus overlapping the voyage of Bastidas. He gave up his unsuccessful search for a strait eventually, and took to the more practical work of hunting for gold. His attempt to found a colony at the mouth of the Rio Belen, southwest of Colon, failed, and on May 1, 1503, he sailed from the shores of the Isthmus. He died on May 20, 1506, still believing that he had discovered the eastern shores of Asia. This belief was shared by all the early voyagers until the discovery of the Pacific Ocean in 1513.

Statue of Columbus and Indian Girl. Presented to General Mosquera of Colombia in 1868, by the Empress Eugenie, and afterwards turned over to Count DeLesseps. Now occupies a commanding position on Cristobal Point.

THE FIRST SETTLEMENT

After the unsuccessful attempt of Columbus to found a settlement in Castilla del Oro (Golden Castile), as the Isthmus was termed, two colonizers were sent out by King Ferdinand. One of these, Diego de Nicuesa, a Spanish nobleman, more fitted for the court than for a command in the wilderness, was given control of all the land between Cape Gracias á Dios, Nicaragua, and the Gulf of Urabá, or Darien, the eastern limit of the present Republic of Panama. The other was Alonso de Ojeda, who accompanied Columbus on his second voyage, and in addition had made two trips to the continent independently. Ojeda was placed in charge of the land east and south of the Gulf of Urabá called Nueva Andalucia. Both of these expeditions outfitted and sailed from Santo Domingo in November, 1509.

Associated with Ojeda were Juan de la Cosa, as lieutenant in the future government, and a lawyer named Bachelleer Enciso, who furnished most of the money to equip the expedition. It was arranged that Enciso should remain at Santo Domingo to collect recruits and supplies, procure another ship, and join Ojeda later at the proposed colony.

Ojeda landed near the present city of Cartagena, Colombia, founded in 1531. Here he attacked and overcame the Indians with a part of his force, the attack on Nicuesa to return to Spain. Knowing that they would immediately go to the King and ask that he be dispossessed, he started in to obtain the gold which he knew the King thought more of than all else, and to make new discoveries which would help his cause. The gold he obtained from the Indian chiefs of the Darien. It was made the price of peace, and Balboa showed his shrewdness by making allies of the Indians after he had obtained their treasure. Such an alliance he made with Careta, the cacique of Coyba, who after his village had been sacked by the Spaniards, left with Balboa one of his daughters as a hostage. Balboa accepted the Indian maiden, of whom he became very fond and, although they were never married according to the Christian rites, she considered herself his wife.

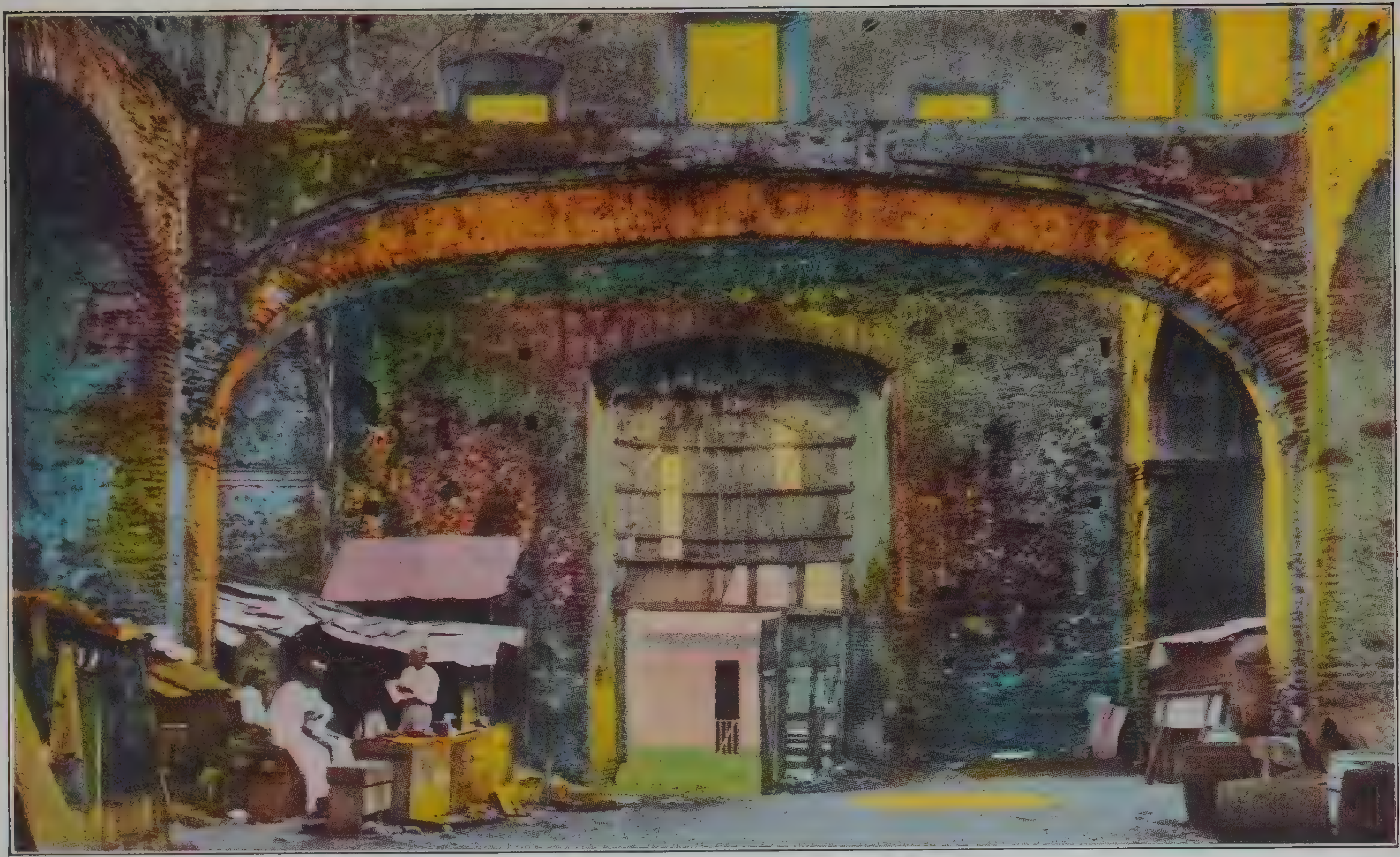
Balboa started from Antigua on September 6, 1513, to cross the Isthmus and find the great sea to the south, of which the Indians, knowing the cupidity of the Spaniards, had told him glowing tales of the riches of the great race of people which inhabited its shores. Fighting the different tribes which he met on the way, subduing and making friends with them, on September 25, he reached a hill in Darien from which it was said the South Sea could be seen. Halting his men, Balboa made the ascent alone, and was the first European to gaze upon this heretofore unknown ocean. Six days later, September 29, 1513, four hundred years ago, he waded into the ocean and took possession in the name of the sovereigns of Spain. This was in the Gulf of San Miguel, so named for the reason that it was discovered on St. Michael's Day. He also performed a similar ceremony when he reached a point of land at the entrance to the gulf. Balboa subdued the local Indian chiefs, who gave him presents of gold and also many pearls from the Pearl Islands a few miles off the shore, and confirmed the rumors of a powerful and rich nation to the south. The Pearl Islands, so

A family of Indians, Darien.

highway," for the commerce across the Isthmus at that time was steadily on the increase, making Panama a place of mercantile importance. In 1534, a route by water for boats and light draft vessels was established from Nombre de Dios along the coast and up the Chagres River to the head of navigation at Cruces. From Cruces there was another trail to the city of Panama. Over these trails pack trains carried on the trade, the river being used in the wet seasons, and when the attacks of the Indians and Cimaroons, (negro slaves, who rebelled and were outlawed), became too frequent on the overland trail. This trade consisted of gold and ornaments stripped from the temples of the Incas, gold from the mines of Darien and Veraguas on the Isthmus, silver from Bolivia, pearls, and also wool, indigo, mahogany, dye woods, cocoa, and tobacco, all bound for Spain, for which the colonists received clothing and foodstuffs in return. For nearly two hundred years the trails from Panama to the towns of Nombre de Dios and Porto Bello were the richest trade routes in the world. Some of this trade even originated across the Pacific in the Philippines and the Indies. Later, after the period of the great trade, 1550-1750, and up to the time of the Panama railroad, the part water and part overland trail from the mouth of the Chagres to Cruces, 34 miles, and thence to Panama, 18 miles, was used by the colonists when California and Oregon were opened to settlement, and by the gold seekers in California in the days of '49.

The three ancient bells of Cruces. This town was one of the oldest on the Isthmus, and was the head of navigation on the Rio Chagres before the days of the railroad. Abandoned in 1913 on account of its being in the lake area.

After Nombre de Dios was destroyed in 1597 by Sir Francis Drake, the royal port was changed to Porto Bello, 17 miles to the southwest. This change was beneficial, as Nombre de Dios was always unhealthful, while Porto Bello had a better harbor and was nearer to the mouth of the Chagres and Panama.



The famous flat arch in the ruins of Santo Domingo Church, Panama City. It is an architectural curiosity of the early day Spanish masons and has withstood the assault of fire and earthquakes. It has a span of over 40 feet, and a rise of two feet, and has stood in the ruins of the old church for 206 years.

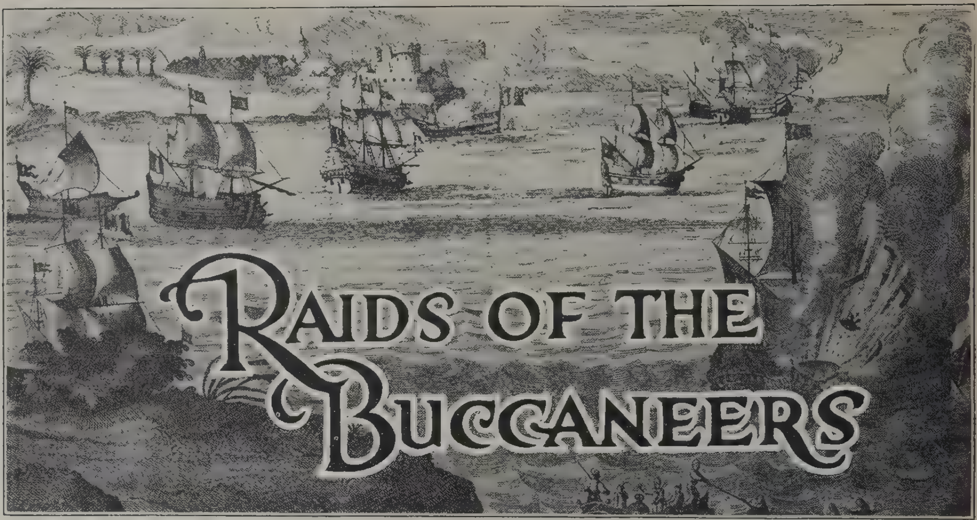
Porto Bello became one of the strongest fortified of the Spanish settlements in the New World. Here, came the Spanish galleons once a year to collect the King's treasure, and to bring supplies for the colonists, and here, each year, on the arrival of the ships, the merchants would congregate to take part in a big fair which was held during the annual visit of the fleet.

The town is situated on a bay about a mile and a half long by 2,500 feet wide, and the ruins of five of the six forts which guarded it, as well as an old custom house, can still be seen, although partly covered with jungle growth. One of the six forts was on the side of the hill on the opposite side of the bay from the old town and where the Isthmian Canal Commission has been quarrying rock for the past four years for Canal work, and it was dug away by steam-shovels. After Porto Bello became the royal port on the Atlantic, the Chagres River and the Cruces trail came into general use as a highway, although there was also an overland road, and to protect this route from pirates who were becoming bold enough to attack fortified towns, Fort San Lorenzo was built in 1601 at the river mouth.

Mouth of the Chagres River. The old fort on the left and one of the turrets on the right.

THE SCOTCH BUBBLE

England lost its opportunity in 1698-1700 to gain a foothold in the Isthmian trade by failing to lend its aid to the colonization scheme of William Patterson, a Scotch financier, who had already founded the Bank of England. Patterson's plan, which eventually cost about 2,000 lives and $100,000 in money, was designed to break up the monopoly of the British East India Company in the Oriental trade by founding a colony on the shores of Darien, and opening up a free trade route across the Isthmus from Acla to the Gulf of San Miguel, over the same route taken by Balboa nearly 200 years before. Permission for the



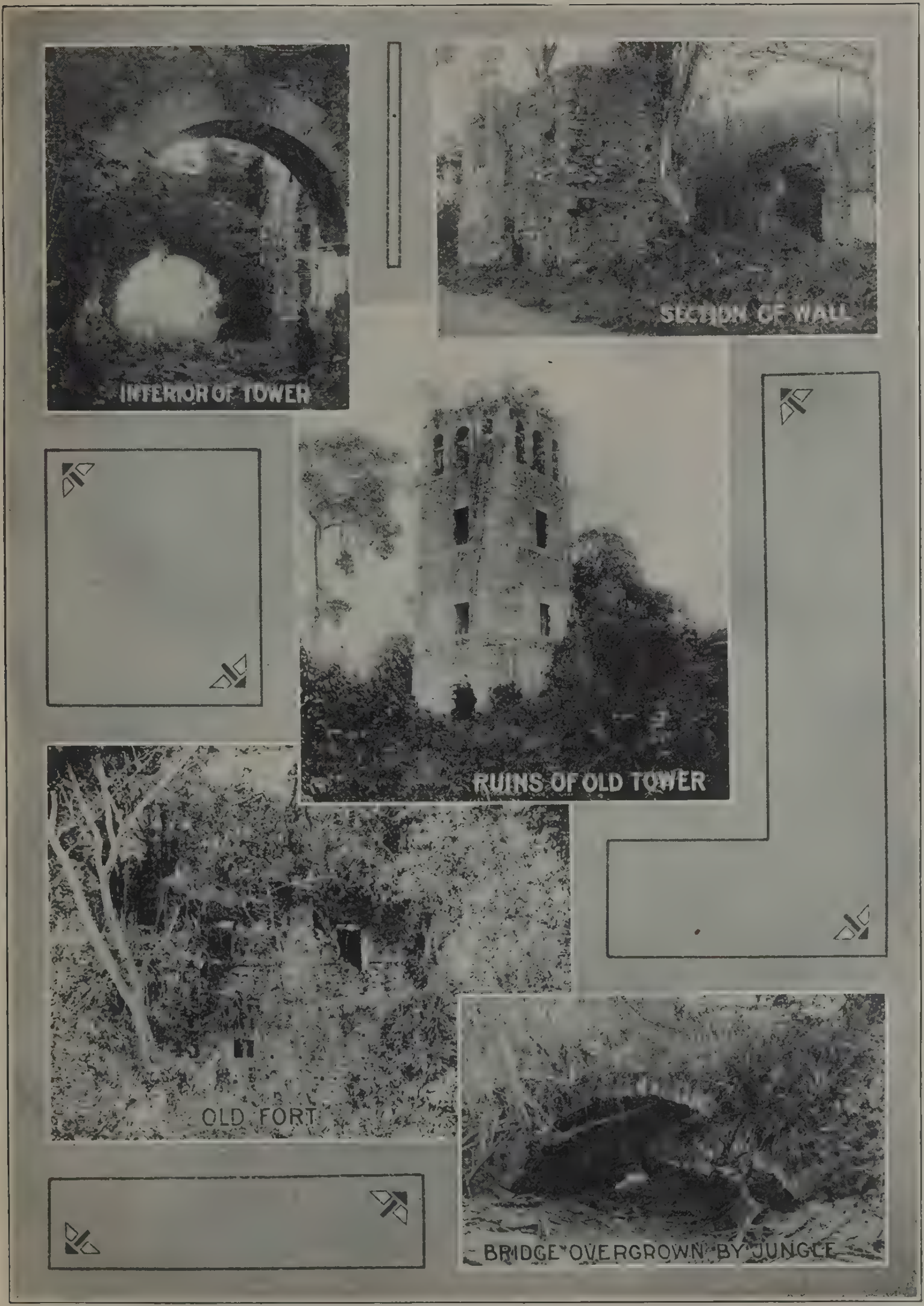
RAIDS OF THE BUCCANEERS

SPAIN monopolized the early trade with its colonies and this policy eventually lost its control of the countries of Central and South America. The first direct result was the entering of English, French and Dutch free traders and later, buccaneers and pirates, all of whom ranged up and down the coast of the Spanish Main preying upon commerce and even attacking the fortified towns.

Up to the time Sir Henry Morgan became Governor of Jamaica, after the sack of Panama in 1671, there was very little difference between free traders, privateers, buccaneers and pirates, their object being the same,—the easy acquisition of gold and other loot by preying upon the commerce of Spain. From 1550 to 1750, the Isthmian trade route was open to such attacks. After the sack of Panama, however, England endeavored to put a stop to piracy in the West Indies (Jamaica was the outfitting station for many ships sailing under commissions granted by the governor who received a share in the spoils), and after that time the pirates were hunted as a common enemy, and they in turn preyed upon the shipping of all nations.

The result of the depredations of these freebooters finally forced Spanish shipping to give the waters of the Indies a wide berth, and to take the longer route through the Straits of Magellan to the colonies on the Pacific, although this trade was already beginning to decline, partly through the failure of the colonies to develop after the easily won treasures of the Incas began to give out, and partly through the decadence of Spain as a sea power.

The free traders, who finally developed into pirates, were generally welcomed by the colonists, unofficially, as Spain was not a manufacturing country and was unable to supply their needs, and because it was greatly to their benefit to obtain goods of a better quality upon which no taxes had been paid to the King. The traders were forbidden entry into the ports, and were compelled to smuggle their goods in at convenient points along the coast and in secret harbors. The custom of treating these men as pirates when caught, naturally led them to protect themselves and, when the opportunity offered, to retaliate in kind, and they finally became buccaneers or pirates in name as well as in fact. The name buccaneer was given to the free traders by the



The tower is the most important remaining evidence of the greatness of the first city of Panama, destroyed by Morgan in 1671. It is located about six miles southeast of Panama City. The wealth of Peru was transported over the old masonry bridges centuries ago.

on Panama and went to Cartagena instead, at which place he met with a decisive defeat. Anson learning of this event, left to attack Manila and the new city of Panama was again saved.

The last of the Spanish galleons from Peru during the latter part of 1739 found upon its arrival at Panama that Porto Bello was being attacked by Admiral Vernon, so it returned to Guayaquil and sent its treasure to Cartagena over the trail from Quito to Bogota. Thus the commerce of the Spanish galleons across the Isthmus ceased, and the gradual decay of the towns on the Isthmus wherein lived the merchants and traders set in.

Pile of cannonballs at Fort San Lorenzo, used by the early Spaniards in resisting the attacks of the buccaneers.

"From sacked Porto Bello redhanded they came,
All bloodstained from conquest unworthy the name,
To the mouth of the Chagres, where, high on the hill,
San Lorenzo kept guard, to plunder and kill
Its devoted defenders, who courageously fought
For homes, wives and children, accounting as naught
Their lives held so precious, so cherished before,
Could they drive the fierce pirates away from their shore.
Three days they repulsed them, but to find every night
The foe still upon them in ne'er-ending fight.
Their arms could not conquer the powers of hell!
San Lorenzo surrendered—ingloriously fell!
Burned, famished and bleeding from many a wound,
They lay while their stronghold was razed to the ground."

—*Gilbert.*

PROPOSED CANAL ROUTES

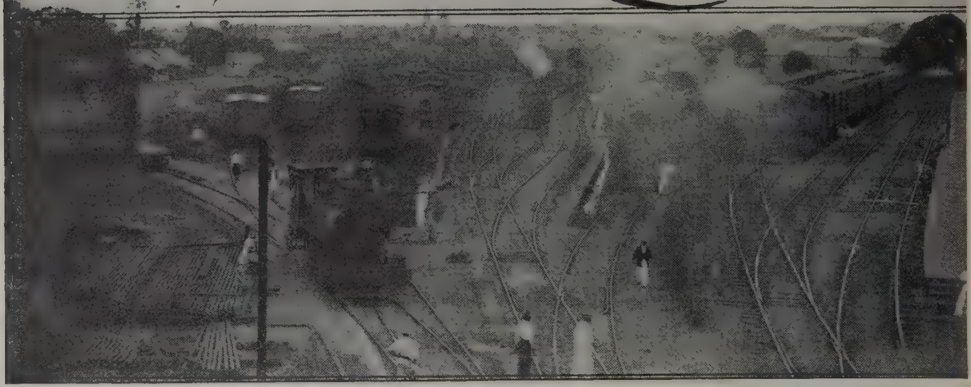
THE project of connecting the Atlantic with the Pacific has attracted the attention of the civilized world since the discovery of the Isthmus. In the years 1534 to 1536, studies were made under the direction of the then governor of Panama, Pascual Andagoya, in compliance with a royal decree, dated February 20, 1534, for a ship canal across the Isthmus by cutting from the Chagres River to the headwaters of the Rio Grande, but the idea was abandoned on account of the excessive cost.

With a revival of interest in the subject, many routes were suggested and many surveys were made at different points where the width of the American Isthmus was found to be favorable, or where rivers and lakes were found that might be utilized as a possible passageway. Of the many routes proposed, it has been found that the one across Nicaragua, utilizing the San Juan River and Lake Nicaragua, and that at Panama along the line of the Panama railroad, utilizing the valley of the Chagres River and the Rio Grande, are the only practicable ones. Of the others, those which gained the most attention and which were given the most study were across the Isthmus of Tehuantepec, in Mexico, and three in Panama, the Darien, or Atrato River, the San Blas, and the Calidonia Bay routes.

TEHUANTEPEC

The Tehuantepec route, where the Spaniards under Cortez, after the conquest of Mexico, built a road across the Isthmus, is the best location, geographically, for a canal, it being so much closer to the Pacific and Gulf ports of the United States, while the distance from New York is practically the same as from Panama. However, the summit level at this point was found to be in the neighborhood of 700 feet and very broad, and it is doubtful if a sufficient supply of water could be obtained for it even if it could be materially lowered by excavation. When the French were at work on the Panama project, Captain James B. Eads selected this place for the location of a ship railway with large cars to transport ships from one ocean to the other. This never got beyond the "scheme" stage, although at that time it was considered practicable by engineers.

The PANAMA RAILROAD



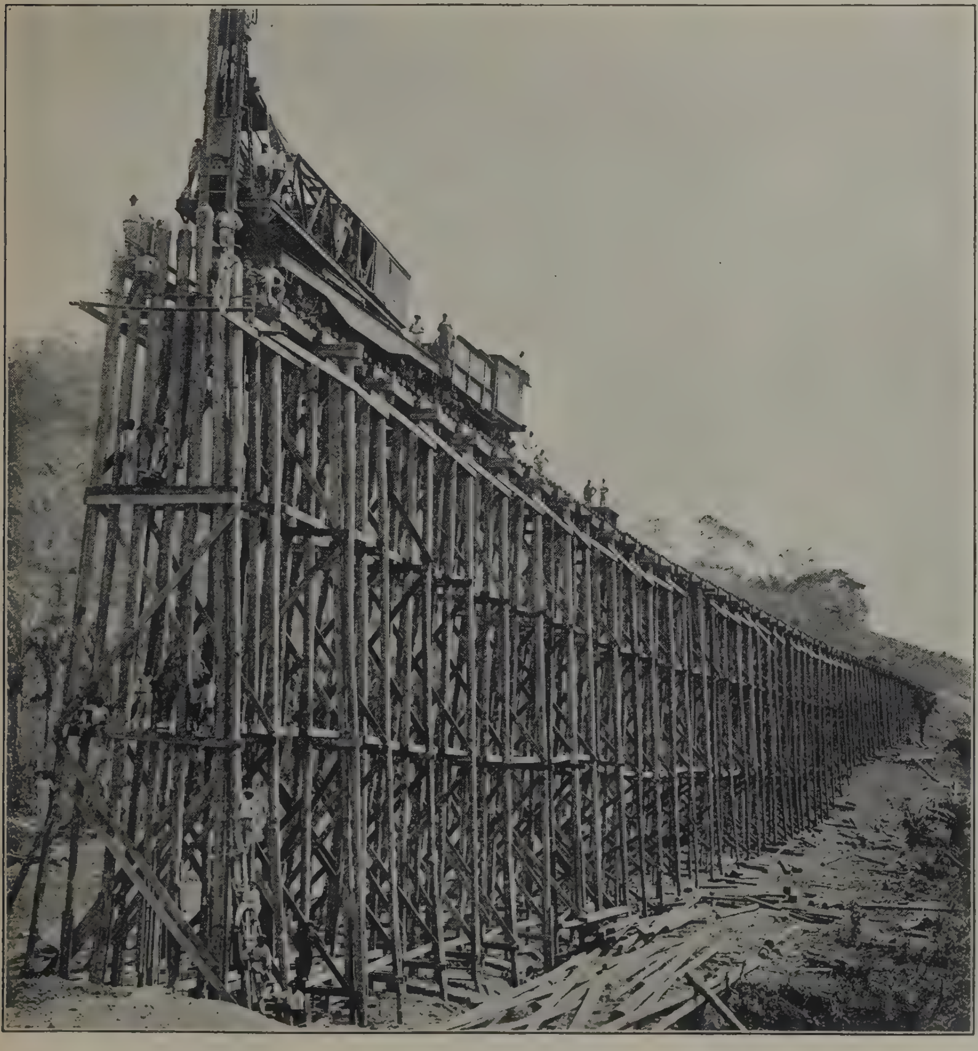
FROM 1750 to 1849, trade across the Isthmus was at a standstill, and the old pack trails from Porto Bello and from Cruces on the Chagres became nearly obliterated through disuse. Spain's belated change of policy, the granting of free trade to the colonies, came too late to be of much benefit to Panama. A few ships discharged their cargoes at the mouth of the Chagres for transportation over the Cruces trail, but there were no adequate facilities for handling any great amount of trade had there been any. What little trade there was went around Cape Horn or via the Cape of Good Hope. The Isthmus became a place of so little importance that it was reduced from a viceregency in 1718, when it became a province of New Granada (the old name for Colombia). It obtained its independence from Spain on September 26, 1821.

In 1849, however, the Isthmus again came to life with the steady flow of emigrants bound for California, where gold had been discovered during the previous year. California and Oregon had also been thrown open to settlement, and the Isthmian transit became almost a necessity, for the only other means of communication with those states were the long overland journey by wagon train across the American continent, and the long voyage around South America. Thus the Isthmus as a trade route again came to the front.

The advantages of an Isthmian railroad as a means of developing the trade of the United States with the growing republics of Central and South America was realized as early as 1835, when President Andrew Jackson appointed Mr. Charles Biddle as a commissioner to visit the different routes best adapted for interoceanic communication by rail or by water between the two oceans. Mr. Biddle visited the Isthmus, went to Bogota, and obtained from the Government of New Granada a concession for constructing a railroad across the American Isthmus. He returned to the United States in 1837 with this document, but died before he was able to prepare a report, so nothing further was done at that time. In 1847, a French syndicate, headed by Mateo Kline obtained a similar concession, but was unable to raise the money necessary to carry out the work. In December, 1848, three far-sighted Americans, William H. Aspinwall, Henry Chauncey, and John L. Stephens, entered into a contract with New

Granada to build the road, and the Panama Railroad Company, with a capitalization of $1,000,000, was incorporated under a charter granted in the state of New York. Aspinwall, in the same year, obtained from Congress a contract for carrying United States mail by steamer from Panama to California and Oregon, as a part of his railroad scheme. A similar mail contract authorized by Congress on the Atlantic side, New York and New Orleans to Chagres, was obtained at the same time by Mr. George Law.

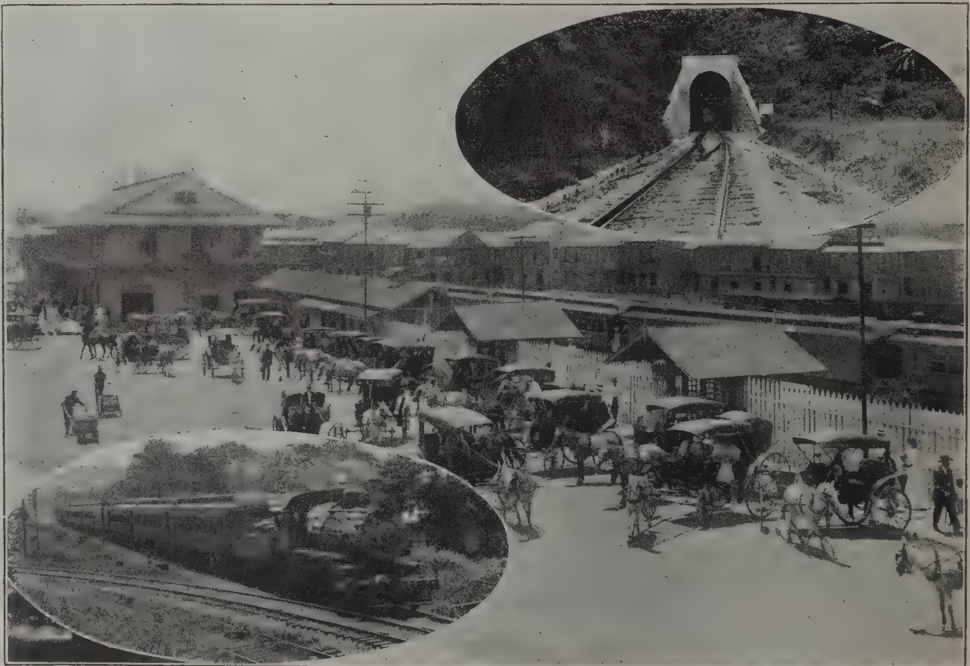
As soon as the concession was obtained from New Granada, Mr. Stephens, accompanied by Mr. J. L. Baldwin, an engineer, went over the proposed route for the road and, finding a summit pass of a little less than 300 feet, decided that



High trestle for embankment fill. The new line was built on a 95-foot level and across the lowlands of the Gatun Lake region a number of long and high trestles for embankment fills, some of them 90 feet high, had to be built.

Although track had been laid from ocean to ocean, the railroad was in poor physical condition, and it was not until 1859 that its construction account was finally closed, at a total expenditure up to that time of $8,000,000. The road was properly ballasted, heavier rails were laid, using hardwood ties, bridges of iron replaced flimsy wooden structures, and station buildings and wharves were erected. To cross waterways, 170 bridges and culverts had been built and the wooden bridge at Barbacoas was replaced by one of iron.

The road was a paying investment from the time when the first 11 miles were opened in 1852, for, as new sections were built they were put into immediate service for passengers and freight, and at the end of 1855, the year the entire road was opened, its income from passengers and freight was $2,125,232.31. When the original construction account was closed in January, 1859, the gross earnings amounted to $8,146,605.00, while operating expenses, together with depreciation amounted to $2,174,876.51, leaving a balance of $5,971,728.66, as legitimate earnings for a period of seven years, during the last four of which the road was open throughout its entire length. Dividends have been paid every year on the stock, with the exception of a few years previous to the taking over of the road from the French Canal Company by the United States. The average dividend during the years 1852-1881 was 16 per cent., and since that period, five per cent; the smallest dividend was two per cent. in 1885, and the largest 44 per cent. in 1868. In 1865, the capital stock was increased from $5,000,000 to $7,000,000. In 1881, the year when the road was sold to the French Canal Company, a



The station of the Panama Railroad at Panama City always presents an active scene at train time. A new first class station has taken the place of the old one shown here. All passenger locomotives are oil-burning and the coaches are thoroughly up-to-date, having first and second class accommodations. The tunnel at Miraflores is 736 feet long.

dividend of 52½ per cent. was declared, but this not only represented the earnings for that year, but also included the assets and surplus on hand at that time.

EARLY RATES NEARLY PROHIBITIVE

The following table of rates, placed in effect when the road was first opened in 1855, remained in force for 20 years, and following the company's policy, were intended to be prohibitive at first, on the theory that they would be lowered when the company had had an opportunity to improve its line, will explain in a measure the large profits made on this road which cost about $170,000 a mile to build:

	1885	1903	1907
Fare, Panama to Colon, 1st-class	$25.00	$5.00	$2.40
Fare, Panama to Colon, 2d-class	10.00	2.25	1.45
Charge for baggage	.10 per lb.	.02 per lb.	.02 per lb.
Freight rate, 1st-class	3.00 per cwt.	.40 per cu. ft.	.50 per cwt.
Freight rate, 2d-class	2.00 per cwt.	1.20 per cwt.	.44 per cwt.
Freight rate, 3d-class	1.00 per cwt.	.80 per cwt.	.32 per cwt.

At the present time the first-class passenger fare is $2.40, with 150 pounds of baggage free; second-class, half of that rate.

ESTABLISHMENT OF STEAMSHIP SERVICE

In 1856, the company established a steamship service between Panama and San José de Guatemala, thus opening up the rich coffee country of Central

The Panama Railroad operates a steamship service with a fleet of six vessels plying between New York and Colon, two of which were purchased in 1908 for the carrying of cement. This is the Panama, one of the passenger steamers.

The total mileage of the road, exclusive of sidings, is 58.79, as follows: Main line, 47.11 miles; Pedro Miguel to Bas Obispo, 9.12 miles, and Panama to Balboa 2.56 miles.

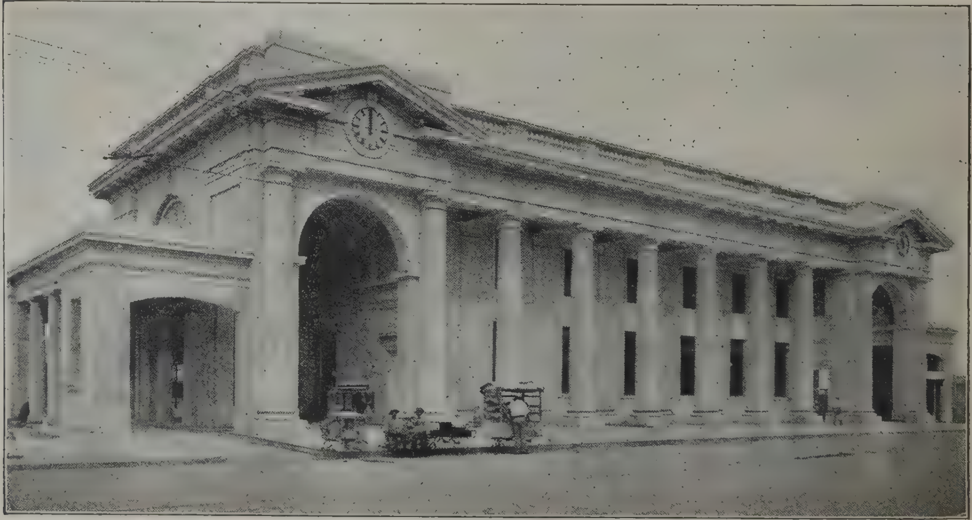
BUSIEST SHORT LINE IN THE WORLD

During the years 1911-1912 the road carried 777,121 first-class passengers, and 1,980,550 second-class passengers, an increase of over 300,000 for the year. During the fiscal year just closed, the passenger traffic is expected to show material increase due in part to the increased tourist travel. Freight amounting to 1,871,076 tons was transported over the railroad during 1911-1912, divided as follows:

	Per cent.
Through commercial freight	36.80
Local and I. C. C. freight	49.93
Local commercial freight	10.37
Panama Railroad Company's freight	2.90

The net revenue from its operation was $1,997,280.80. The steamship line, on the other hand, has not paid as an investment, except as a feeder for the railroad, and for the benefit of the Isthmian Canal Commission. It has had a steady freight and passenger traffic, but the cargoes have consisted principally of canal supplies, and the passengers have been mostly employes of the Canal Commission and railroad, who are carried at a reduced rate. The net deficit from the operation of the steamship line for the fiscal year ending June 30, 1912, was $305,742.85.

With the completion of the canal it is possible that the road will be electrified, obtaining the necessary power from the hydroelectric plant at Gatun spillway, and will be devoted almost entirely to local traffic. This traffic will, no doubt, be considerable, for Colon and Panama will always be important cities.



New Panama railroad passenger terminal in Panama, just completed.

THE FRENCH FAILURE

THE French attempt to construct a waterway across the Isthmus was foredoomed to failure because the project fell into the hands of promoters and speculators. A contributory cause was the very high sick and death rate among the French employes on the Isthmus. This added greatly to the cost of administration and resulted in an unstable labor force. Many of the best engineers left the Isthmus after short service, or died, and these constant changes made it difficult to pursue any regular plan to keep up an effective organization to carry on the work. The company had to pay high wages and offer special inducements to persuade men to take the chance of one in five of surviving an attack of yellow fever which they were liable to contract. Had the work been in charge of a rich and powerful government, public opinion would not have allowed the work to have been carried on at such an appalling cost of life. When the enterprise was started the method of transmission of malaria and yellow fever was unknown, and, even if the French had taken the sanitary precautions prevailing at that time, they could not have stamped out these two fevers which gave the Isthmus the reputation of being the most unhealthy place in the world for a white man. As a private corporation, it could not enforce sanitary regulations had it desired to do so, for, unlike the United States, it did not acquire absolute jurisdiction over the Canal strip, but was at the mercy of the Colombian courts.

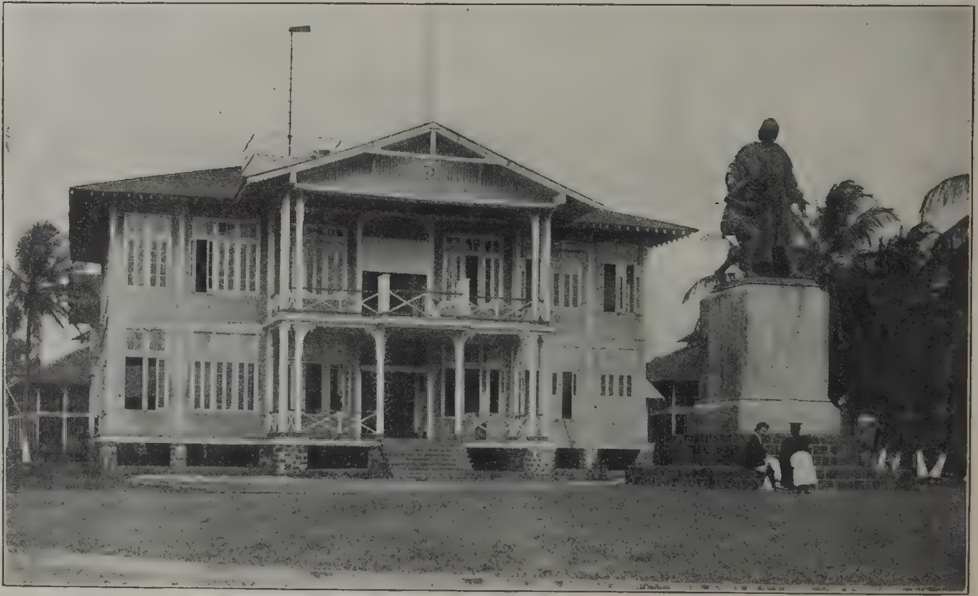
Other causes were extravagance, which naturally developed into graft, for the supply of money which came flowing into the coffers of the company from eager investors beguiled by the name of De Lesseps seemed inexhaustible; the lack of suitable machinery, the want of preparation, and misguided leadership. All these mistakes have served as warning signals to the Canal Commission, so that the failure of the French has contributed, in a large measure, to the success of the Americans.

DE LESSEPS—PROMOTER

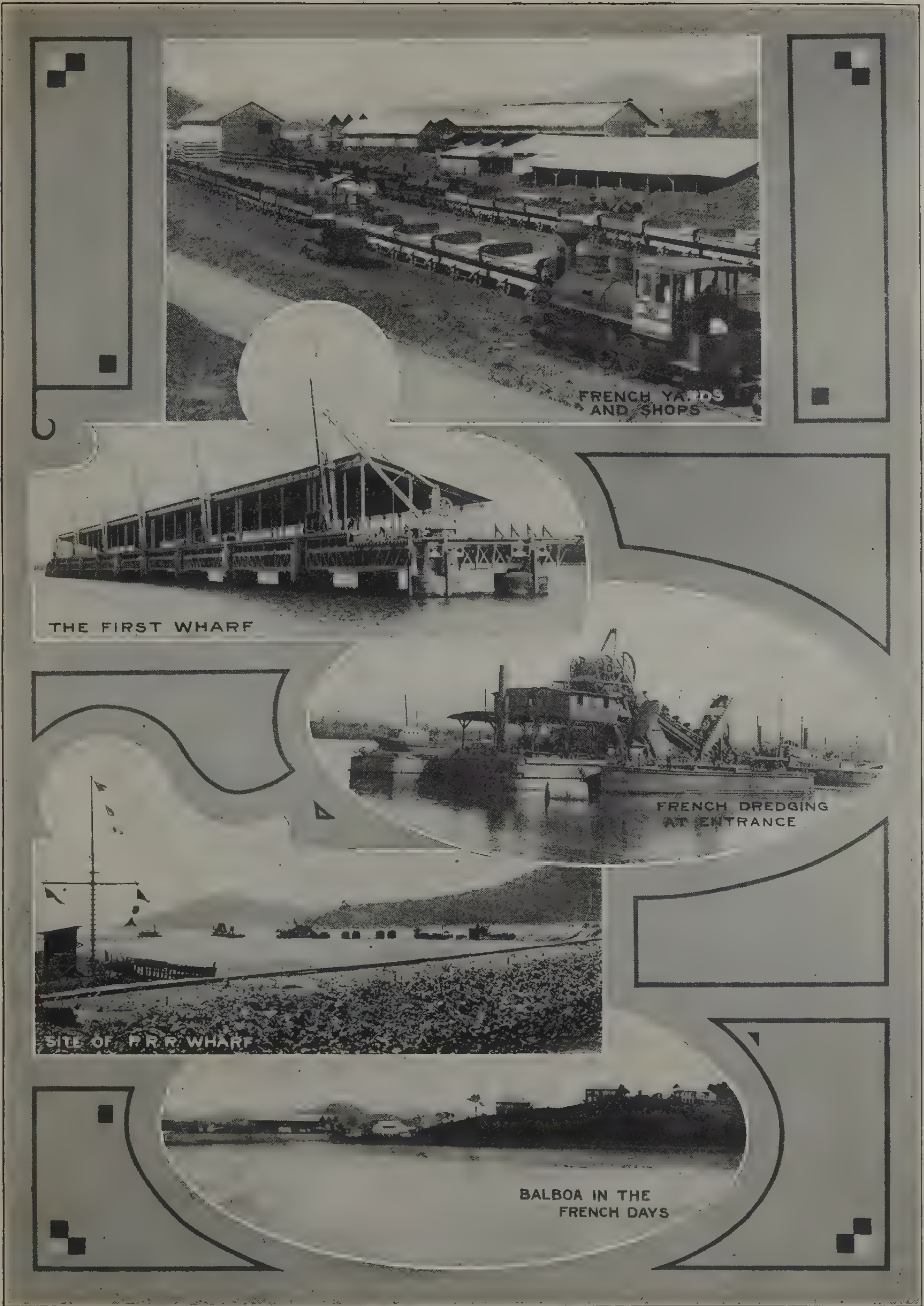
The first French Canal Company, La Societe International du Canal Interoceanique, inaugurated the undertaking with an exclusive concession from Colombia, but with an incomplete survey of the proposed work, and an estimate of cost and time placed much too low. The necessary money was

Count Ferdinand de Lesseps. His name will always be linked with the great enterprise as it was under his direction and control that the work first took definite form.

obtained from the French middle classes, who were induced to part with their savings through the magic name of Ferdinand de Lesseps, who had just brought to a successful close his great work at Suez, and who was placed at the head of the new enterprise. De Lesseps was honest and sincere, but he was an old man, somewhat blinded by his previous good fortune, and, therefore, easily deluded. He was enthusiastic over the idea of a canal connecting the Atlantic with the Pacific, and made himself and others believe that the work could be accomplished more quickly and much easier than the Suez. His ability as a missionary made him valuable to the promoters, for the difficulties of the work across the Isthmus, as compared with the work at Suez should have been apparent even to the layman. He was not an expert engineer; it did not require any engineering ability, but merely imagination, to see the practicability of cutting a sea level channel through the low desert region of upper Egypt, while at Panama, a hilly and



Former headquarters of De Lesseps, Cristobal, now used by the Canal Commission.



A group of views of Balboa and the canal entrance and operations, during the days of both the First and Second French Companies. The wharf was the first constructed by the French. The one-sided dump cars shown in the top picture are now obsolete.

The pick and shovel brigade.

later. "The Bulletin du Canal Interoceanique," published by the company for the benefit of the stockholders, of February 1, 1882, states: "The first work in the great cut of the maritime canal was formally inaugurated today (Jan. 20, 1882), at Empire in the presence of the dignitaries of the state, the leading citizens of the city and a great assemblage of the people. The first locomotive has arrived at the newly opened excavation. The city of Panama is celebrating the event with a great fete."

De Lesseps left Colon for the United States on February 22, 1880, for the purpose of interesting Americans in the undertaking. Although he was received with a great deal of enthusiasm everywhere, he was unable to dispose of the stock which he had thoughtfully reserved. Americans were interested in a canal, but not in a canal under French control. He then proceeded on a similar tour of Europe, where he was more successful from a pecuniary point of view. The first issue of stock, 600,000 shares of $100 each, was subscribed twice over, mostly taken in France. These shares were distributed among 100,000 persons, indicating the great Frenchman's popularity with the people of his country. In 1888, when the company failed, the total subscriptions, stocks and bond issues, had reached $393,505,100, and the shareholders numbered 200,000.

Two years of feverish preparation followed which witnessed the making of hasty surveys, the bringing together of machinery and a labor force, and the erection of quarters and hospitals. The actual construction work was let to a firm of French contractors, Couvreaux & Hersent, but they soon realized the difficulties of the undertaking and withdrew from the last part of their contract.

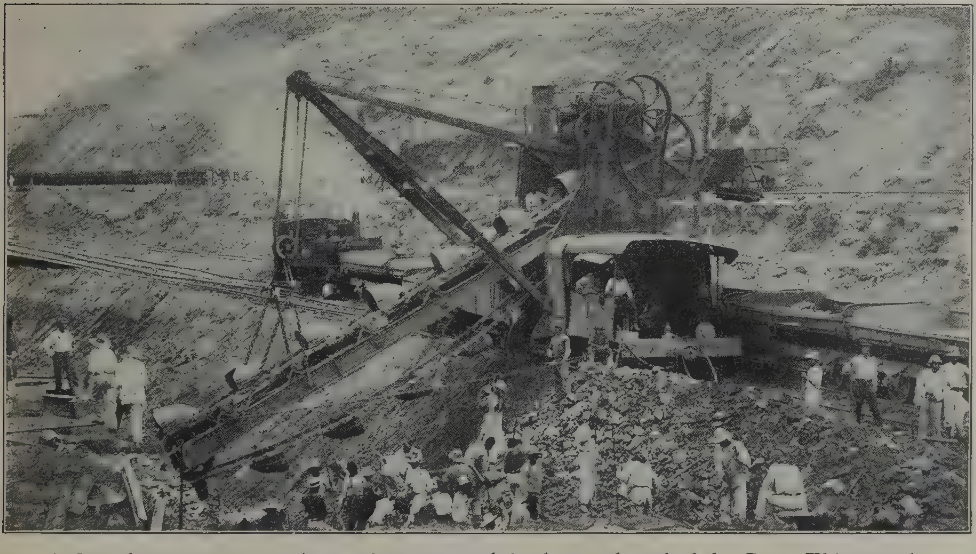
FRENCH LABOR FORCE

There seems to have been little difficulty experienced in obtaining a labor force, which in 1888, numbered about 20,000 men. Nine-tenths of these were

Under the new canal company, the hospitals were turned over to the Sisters of Charity who took care of the few patients admitted at a fixed charge. As the revenue from patients was small, they had a hard time to keep them open at all, and were compelled to sell flowers, fruits, vegetables and other products from the hospital grounds. When the Americans took charge these women were replaced by trained nurses.

THE CRASH

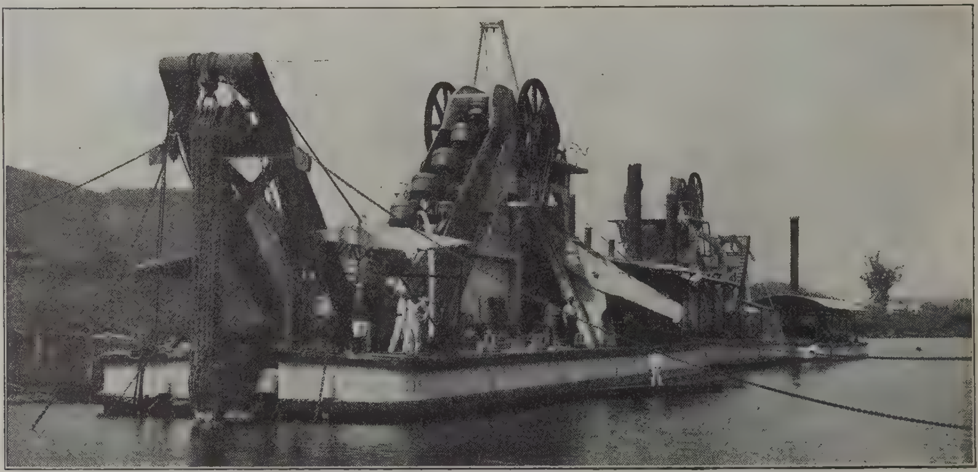
The crash came in December, 1888. At this time $156,654,687.00 had been expended on the Isthmus, and in Paris, $78,140,330.00, a total of $234,795,017.00. This vast sum is said to have been "one-third expended on the canal work, one-third wasted, and one-third stolen." Of that spent at Panama, salaries and expenses of management aggregated $16,540,883; rents and maintenance of leased property, $3,301,070; material and supplies, $29,722,856; buildings, $15,397,282; construction and engineering expenses, $89,434,225; land purchases, $950,655; and medical and religious attendance, $1,836,768. In view of the various forms of graft, extravagance and waste, it is not surprising that there was so little to show in actual work accomplished. At the end of eight years the work was about two-fifths completed.



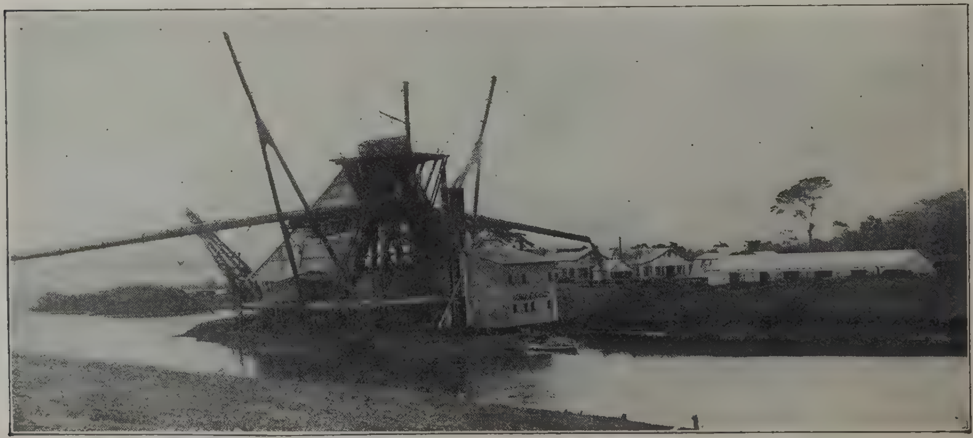
A French excavator opening a pioneer trench in the south end of the Cut. This was the best known method of excavating in that day.

The work was let to contractors, very few of whom faithfully performed the service for which they were paid. Many made small fortunes. Those who were intrusted with the work of excavation were paid for the amount of spoil which they took from the canal prism. As there was no data available on the cost of such work, it was impossible to even estimate what the charge should be. In many cases the contractors took out what was most easily excavated, avoiding the hard spots. One notable exception to this was the dredging work done by the American Dredging and Contracting Company, which dredged the opening of the Canal from Colon to beyond Gatun.

First French Company's days. Dredges working in the canal at Mindi.



Two French ladder dredges working on the Chagres River, opposite Gorgona 20 years ago.



The French suction dredges with the carrying pipes, were effective in excavating, but like their cableways, did not carry the spoil far enough.

Chagres River, to be supplied with water by pumping, was decided upon. Under the new plan, it was estimated that the cost would reach $351,000,000 and would require 20 years to build. There had already been spent at this time nearly $250,000,000, and only about two-fifths of the work had been accomplished. The end was in sight.

Work was pushed forward under the new plan until May, 1889, when the company became bankrupt and a liquidator was appointed to take charge. Under the liquidator, the work gradually diminished and was finally suspended on May 15, 1889. It was soon realized that the only way anything could be saved to the stockholders was to continue the project. Late in 1889, the receiver appointed a commission composed of French and foreign engineers, eleven in number, to visit the Isthmus and determine whether or not the canal could be completed. This commission reported on May 5, 1890, that a lock canal might be completed within eight years at a cost of $174,600,000. It reported that the plant on hand was in good condition and would probably suffice for completing the canal. It also estimated the value of the plant and the work already accomplished at $87,300,000, or one-half of the total cost.

Old French locomotives. One hundred and nineteen of these were rebuilt and used by the Americans.

Meanwhile, as a result of the exposure and investigation of the affairs of the old company, M. De Lesseps and his son Charles were sentenced to five years imprisonment, and similar sentences were imposed upon several others of their associates. The French Court of Appeals annulled the sentence of Charles de Lesseps, and that against his father was never executed for, at that time, January 10, 1893, he was 88 years old and a physical and mental wreck; he died in the month of December, following.

As the Wyse concession had nearly expired, the receiver obtained from Colombia an extension of ten years. It was stipulated that the new company should be formed and work upon the canal resumed on or before February 28, 1893. As this condition was not fulfilled, a second extension of 10 years was obtained, to run not later than October 31, 1894.

THE SECOND OR NEW COMPANY

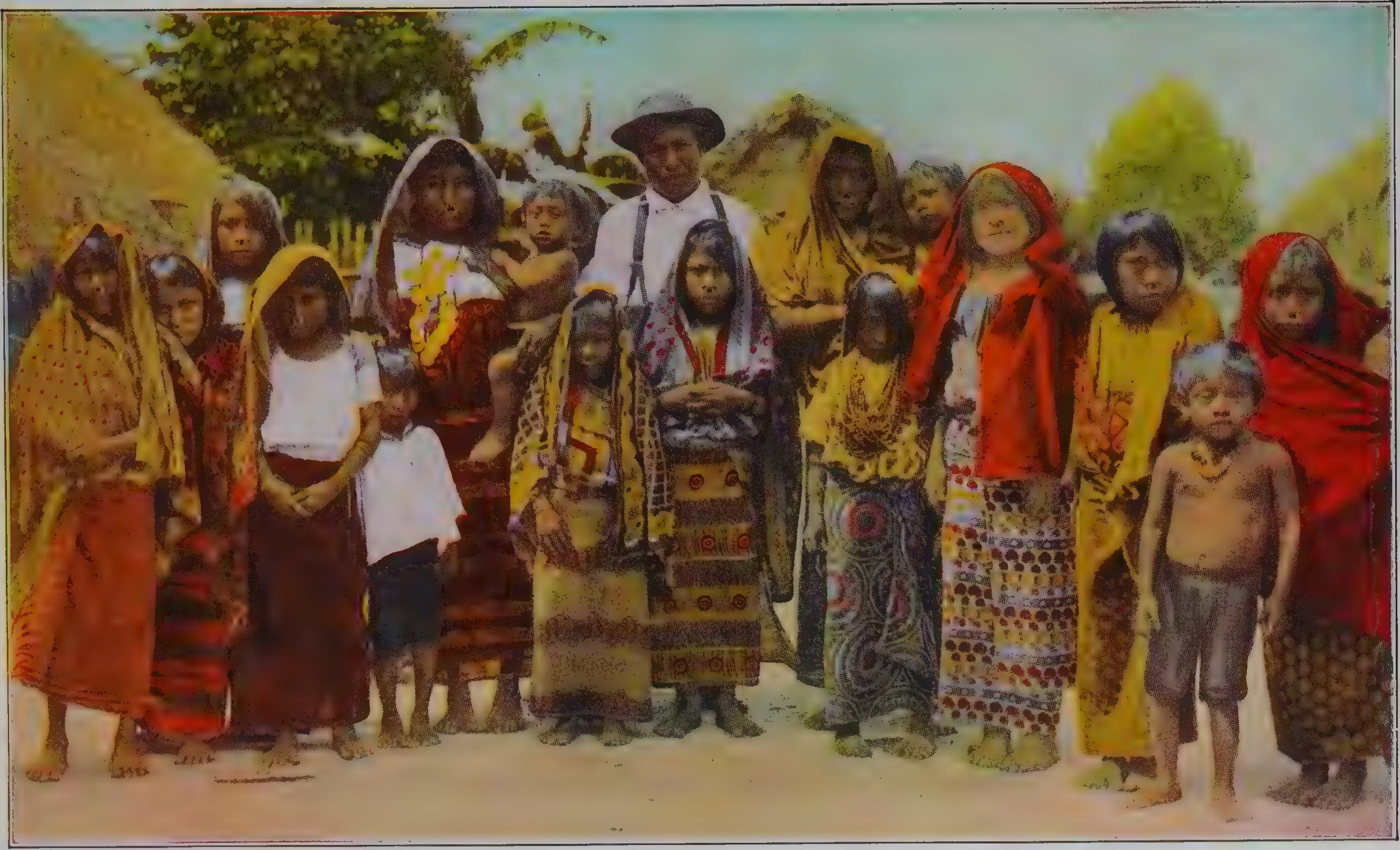
The Compagnie Nouvelle du Canal de Panama, the New French Canal Company, as it is generally known, was organized under a special law on October 20, 1894, with a capital stock of $13,000,000, with shares valued at $20 each. Six hundred thousand shares were sold for cash, the greater part being taken by the receiver, the contractors, and others, who had been interested in the old company and escaped criminal prosecution by taking the new stock; and 50,000 shares given to the Colombian Government for the extension of the concession. The new company took possession in 1894, and work was immediately resumed in Culebra Cut with a force large enough to comply with the terms of the concession. As excavation work at this point was necessary under any plans that might be decided upon, it was continued, while elaborate and extensive studies of the Canal project were begun by competent engineers.

The plan finally adopted by the new company involved two levels above the sea, one an artificial lake to be created by a dam across the Chagres River at Bohio, and another a high level canal through Culebra Cut at an elevation of 68.08 feet above mean tide, to be fed by water by a channel leading from a reservoir to be constructed at Alhajuela in the upper Chagres River valley. The lake level was to be reached from the Atlantic by a flight of two locks, and the summit level by a second flight of two locks. On the Pacific side four other locks were provided for, the two middle ones at Pedro Miguel being combined in one flight, and the others being located at Paraiso and Miraflores. On the Atlantic side there was to be a sea level channel to Bohio, 17 miles inland, and on the Pacific side at Miraflores, about 8 miles inland. The depth of the canal was to be 29.5 feet, with a bottom width of 98 feet. The locks were to be in duplicate, 738.22 feet long, 82.02 feet wide, with a normal depth of 29.5 feet. The lifts were to vary from 26 to 33 feet.

A number of old French dredges, which were valueless except as junk, when the United States acquired them.

A second plan was also worked out in which the upper level was omitted, the cut through the divide being deepened to 32 feet above sea level, making the artificial lake created by the dam at Bohio the summit level. Under this plan the feeder from Alhajuela was omitted, although the dam was to be retained to control the Chagres. One flight of locks on the Atlantic side and one lock on the Pacific side were also to be omitted. The estimated cost of completing the canal under this plan was not much greater than the first, and all work on the first plan for several years would be equally available under the second.

Although the first plan was adopted on December 30, 1899, no effort was made to carry it out, on account of the interest being shown by the United States in a canal across Nicaragua. It was realized that if the United States should undertake to construct such a waterway, the work accomplished and the plant on the Isthmus would be practically worthless. In 1895, there was a force of

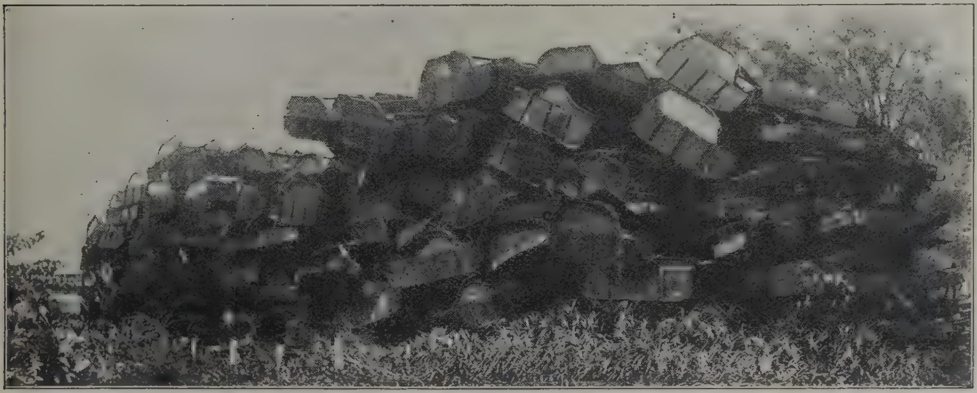


Among the several tribes of Indians in the Republic of Panama, the San Blas or Cuna-Cunas, who inhabit the hundreds of islands and islets that fringe the Caribbean coast, are the most conspicuous. They are a small statured people, fond of ornaments and bright-hued raiment. They subsist on vegetables and fish, and, until recently, it has been a tribal law that no stranger should be permitted to remain after nightfall.

men numbering about 2,000 at work in Culebra Cut, and a year later this was increased to 3,600. This was the largest number of men employed under the new company, for only enough work was done to hold the concession and keep the equipment in a salable condition. The French at that time were beginning to look for a purchaser; they wanted $100,000,000 for the work and equipment, but the only likely buyer was the United States. The Isthmian Canal Commission, appointed by the Spooner Act of 1899, reported in November, 1901, in favor of the Nicaragua route unless the French company was willing to sell out at $40,000,000. This recommendation became a law on June 28, 1902, and the New Panama Canal Company was practically forced to sell for that amount or get nothing.

Although the French on the Isthmus worked under difficulties which eventually forced them to give up the Canal undertaking, they removed with their clumsy side excavators, now obsolete dredges, small Decauville cars and toy Belgium locomotives, a considerable amount of material from the Canal prism, a large part of which has been found useful under the present plan.

The old company excavated 66,743,551 cubic yards, from 1881 to 1889, and the new company excavated 11,403,409 cubic yards up to 1904, a total of 78,146,960 cubic yards; 18,646,000 cubic yards of this total were taken from Culebra Cut, the operation of the new company being practically confined to that portion of the work. Of this total, it has been figured that 29,908,000 cubic yards have been useful to the Americans. The old company dredged a channel from deep water in Panama bay to the wharves at Balboa which has been used by ships docking at that port. On the Atlantic side, the channel dredged inland, known as the French canal, was found useful upon deepening in bringing sand and stone for the locks and spillway concrete at Gatun.



A pile of old French dump cars. Many tons of this scrap material have been collected along the line of the Canal.

The French also turned over valuable surveys and studies of the work, together with plans that have been found of great value to the American organization. The best of this class of work was done under the new company.

This is especially true of the records kept of the flow and floods of the Chagres River, together with rainfall records, so essential to the present plan.

FRENCH AID TO AMERICAN PROJECT

Much of the work of preparation during the first two years of American occupation—1904-1905—would have been seriously delayed without the French supplies and equipment. In the shops and storehouses were found a plentiful supply of repair parts, shop tools, stationary engines, material and supplies of all kinds of good quality. At Gorgona, where the principal shops were located, known during the French times as Bas Matachin shops, were found sheds filled with old locomotives, cranes and excavators. One hundred car loads of foundry and machine shop material were removed from this point. Repair shops were found at Empire, Paraiso, Gatun and Bohio. A small machine shop was uncovered in the jungle at Caimito Mulato, when American engineers were running the center line of the Canal. There was also a dry dock at Cristobal, which was originally 190 feet long, 32 feet wide and 16 feet deep over the sills at ordinary high tide. At Balboa on the Pacific side, there was located a repair and marine shop for the floating equipment. The old French shops in every case formed the nucleus of the larger and better equipped shops maintained by the Americans during the period of construction.

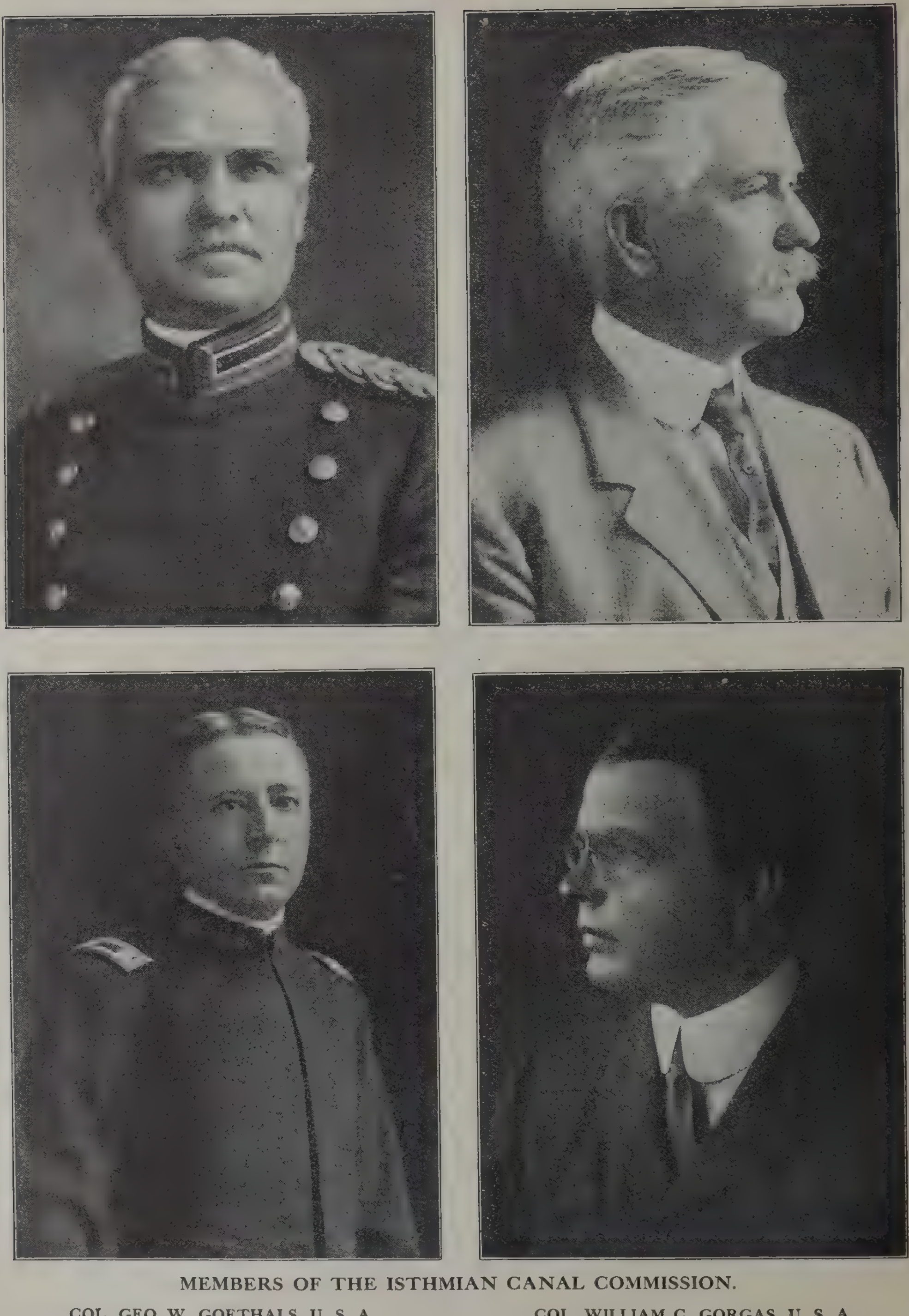
Another view of a part of the old machinery, a legacy from the French. All of the junk along the line of the Canal, both French and American, is being turned into dollars, having been sold to a Chicago wrecking concern.

During the first two years of American occupation, French locomotives were the only ones available by the Isthmian Canal Commission. On June 30, 1906, there were 106 in service, and only 15 American locomotives. The same is true of the French dump cars. In 1904, there were 308 in service, and in 1905, over 2,000 had been repaired and put in commission, as compared with 300 American-built cars. At the present time there are about 100 French locomotives and 200 Decauville dump cars in serviceable condition. In December, 1904, there were six old French excavators working in Culebra Cut,

The AMERICAN TRIUMPH

AN Isthmian Canal Commission organized for the construction of the Canal was appointed under the provisions of An Act of Congress approved June 28, 1902, called the Spooner Act. This Act authorized the President to acquire, in behalf of the United States, at a cost not exceeding $40,000,000, the rights, franchises, property, etc., including the shares of the Panama railroad, owned by the New French Canal Company, and to obtain from the Republic of Colombia perpetual control of the necessary strip of land across the Isthmus, which control should also include the right to perpetually maintain and operate the Panama railroad, and jurisdiction over the ports at either end.

If the President should be unable to obtain a satisfactory title to the property, and the control of the necessary territory, within a reasonable time and upon reasonable terms, then the Commission was authorized to construct a waterway across Nicaragua, using Lake Nicaragua and the San Juan River, after the President had first obtained perpetual control, by treaty with Costa Rica and Nicaragua. The impossibility of the United States to come to a satisfactory agreement with Colombia, who thought that the United States was now committed to construct a canal across Panama and, therefore, could be made to pay a larger amount than first offered, led to the revolution of November 3, 1903, by which Panama, a state of Colombia became the Republic of Panama, and the signing of a treaty by the new Republic by which the United States was granted in perpetuity the necessary territory. This strip of land, known as the Canal Zone, containing about 436 square miles, extends from deep water in the Atlantic to deep water in the Pacific (three miles from the low water mark on either side), and five miles on either side of the center line of the canal. Included in this grant are the Islands of Naos, Perico, Flamenco and Culebra in the Bay of Panama, which are now connected with the mainland by a breakwater, and upon which fortifications are being placed. The cities of Panama and Colon are excluded from the limits of the Canal Zone, but the United States exercises sanitary control over them, and also has the right to maintain public order in them in case the Republic of Panama should not be able in the judgment of the United States to do so.



MEMBERS OF THE ISTHMIAN CANAL COMMISSION.

COL. GEO. W. GOETHALS, U. S. A.,
Chairman and Chief Engineer.

COL. WILLIAM C. GORGAS, U. S. A.,
Chief Sanitary Officer.

COL. HARRY F. HODGES, U. S. A.,
Assistant Chief Engineer.

H. H. ROUSSEAU, CIVIL ENGINEER, U. S. NAVY,
Assistant to the Chief Engineer.

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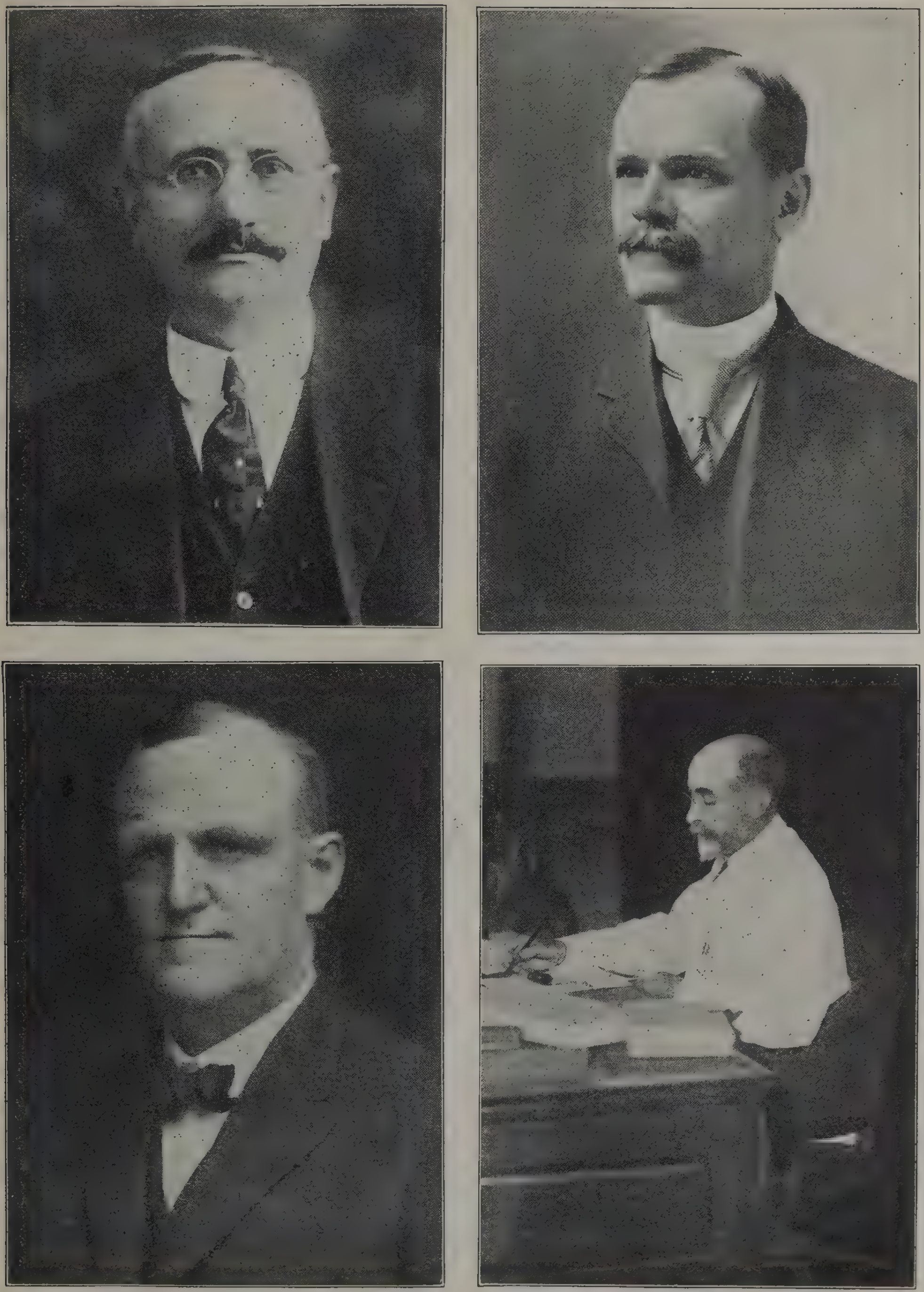

MEMBERS OF THE ISTHMIAN CANAL COMMISSION.

COL. WILLIAM L. SIBERT, U. S. A.,
Division Engineer of the Atlantic Division.

COL. D. D. GAILLARD,
Division Engineer of the Central Division.

HON. RICHARD LEE METCALFE,
Head of Department of Civil Administration.

JOSEPH BUCKLIN BISHOP,
Secretary.

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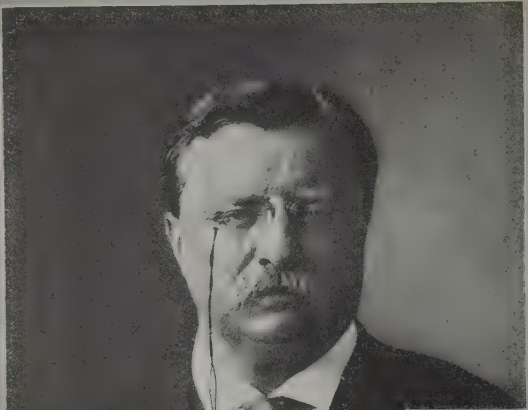
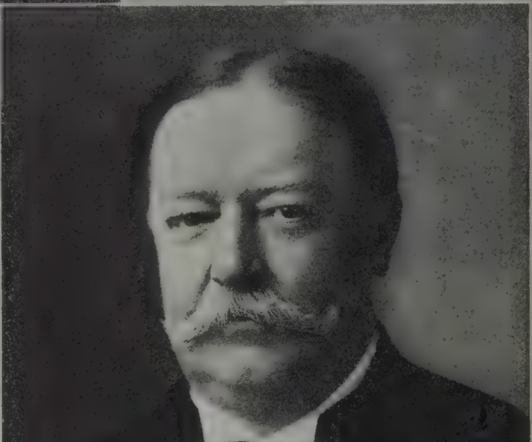


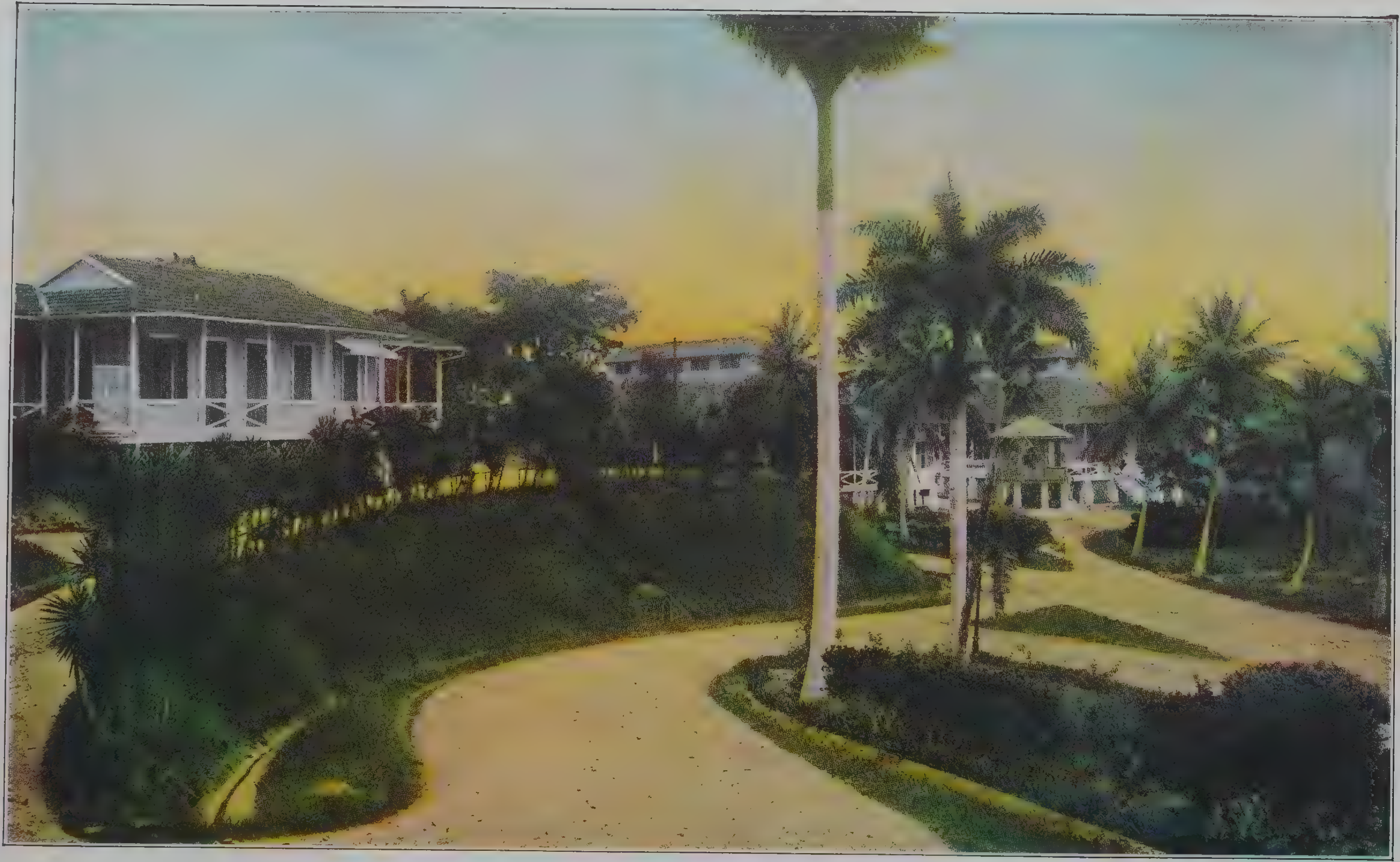
Ex-President
Theodore Roosevelt

Ex-President
William H. Taft



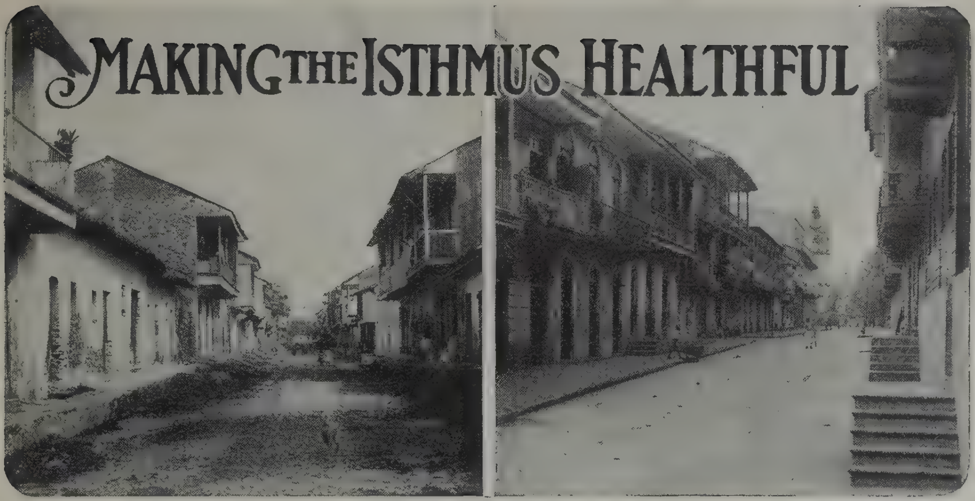
President
Woodrow Wilson

The chroniclers of history for all time will associate the names of Roosevelt, Taft and Wilson with the world's greatest undertaking,—the construction of the Panama Canal. Students of the subject will doubtless concede that to Theodore Roosevelt should be accorded the distinction of inaugurating the enterprise, to his successor, former President Taft should belong the honor of four years of faithful service in carrying forward the stupendous work so encouragingly begun, and to President Woodrow Wilson falls the duty of installing the splendid success which the resources, perseverance and indomitable courage of American citizenship have rendered possible.



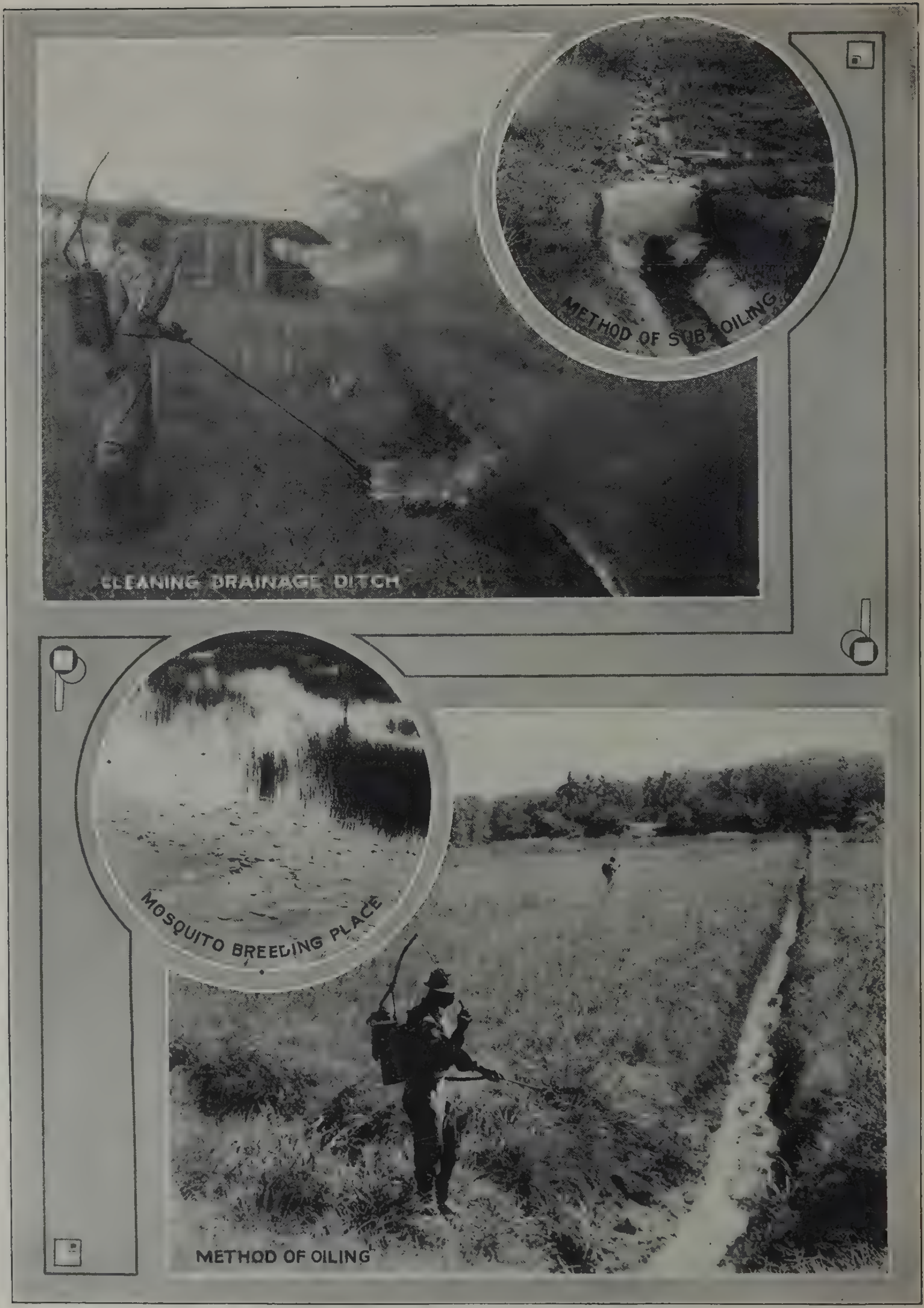
One of the driveways in Ancon Hospital grounds. Ancon Hospital is world-famed, and the grounds are among the most beautiful in existence. The site covers about 80 acres, on the slope of Ancon Hill, and the environment is decidedly pleasing to the eyes of both the sick and well. Over 250 varieties of trees and plants are grown in the grounds.

MAKING THE ISTHMUS HEALTHFUL

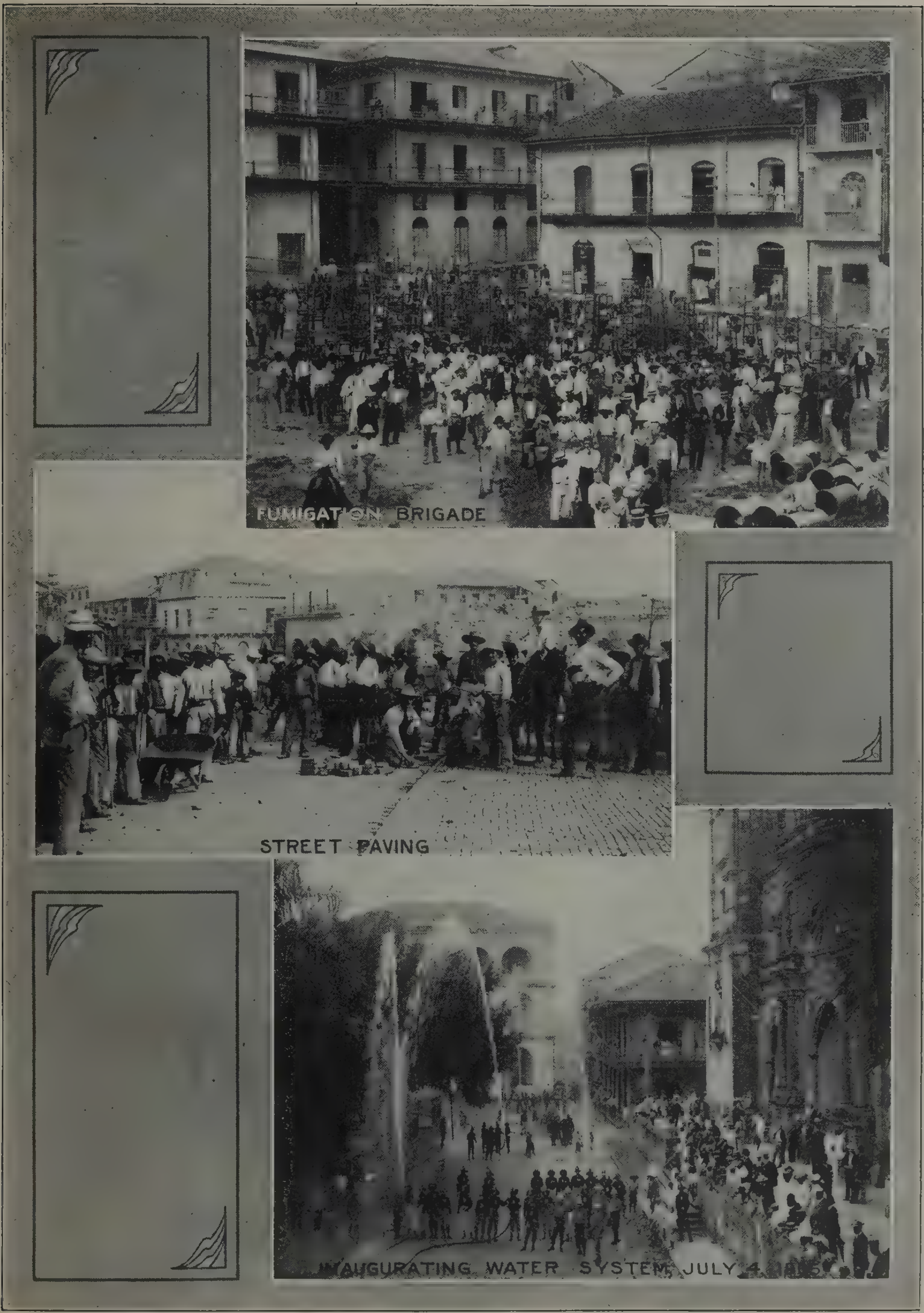


THE high mortality among employes encountered by the builders of the Panama railroad and by the French during their operations indicated that, to keep a suitable working force on the Isthmus, the Canal Zone, and the cities of Panama and Colon would have to be made healthy. Realizing this, one of the first divisions of the canal work to be established was that of sanitation under Col. W. C. Gorgas, who, prior to his arrival on the Isthmus, had successfully stamped out yellow fever and substantially reduced the high malaria rate in Havana, Cuba. This division was at first a part of the Department of Government of the Canal Zone, but, on account of the importance of the sanitary work it was later made a distinct and separate department. That its work under the direction of Colonel Gorgas has been entirely successful, may at this day, be readily seen. Instead of a pest hole with an unsavory reputation as "a white man's graveyard," the Isthmus has become a winter resort for an increasing number of tourists each year. Not only was it necessary to free the Isthmus from pestilence in order that the canal work might be accomplished, but it was just as necessary that it be kept in that condition for all time.

Dr. Ronald Ross of the British Army in India is credited with the discovery, through successive experiments in 1898, that the *Anopheles* mosquito is the germ-carrier for malaria. This mosquito bites an infected person and carries the germ to other persons. In the same way another species of mosquito, the *Stegomyia*, was found to be responsible for yellow fever. The theory of yellow fever transmission by mosquitoes was exploited as early as 1883, by Dr. Carlos Finlay of Havana. The definite and indisputable test was made in July, 1900, at Quemados, Cuba, by four members of the United States Army Medical Corps, who had been appointed as a commission for the study of the disease. These four men were Doctors Walter Reed, Jesse W. Lazear, James Carroll, and Aristides Agramonte. One of these men, Dr. Lazear who allowed himself to be bitten by an infected mosquito, died from the resulting attack of yellow fever. Dr. Carroll also contracted yellow fever during the experiments, but recovered. A reward of $200 was offered to encourage volunteers, and of the many enlisted men who took part in the experiments, the first to present themselves were John R. Kissinger and John J. Moran, both of whom stated that



Every square foot of swamp was a breeding place for mosquitoes. Draining swamps, subsoiling and burning grass, are some of the methods used in the prevention of mosquito breeding. The man in the upper picture is shown burning grass which grows along the open ditches and drains. In the lower picture he is shown spraying larvacide on the grass.

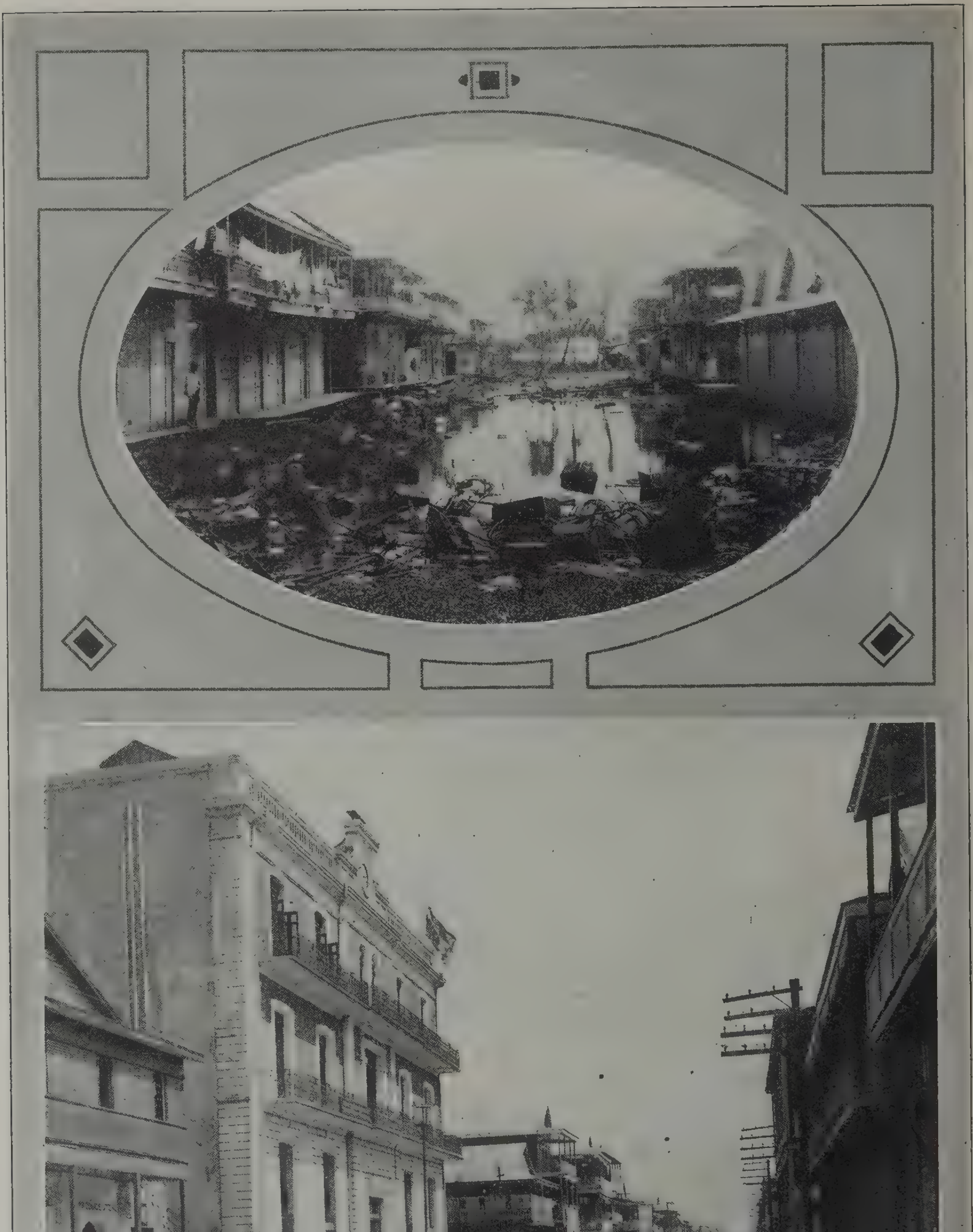


FUMIGATION BRIGADE

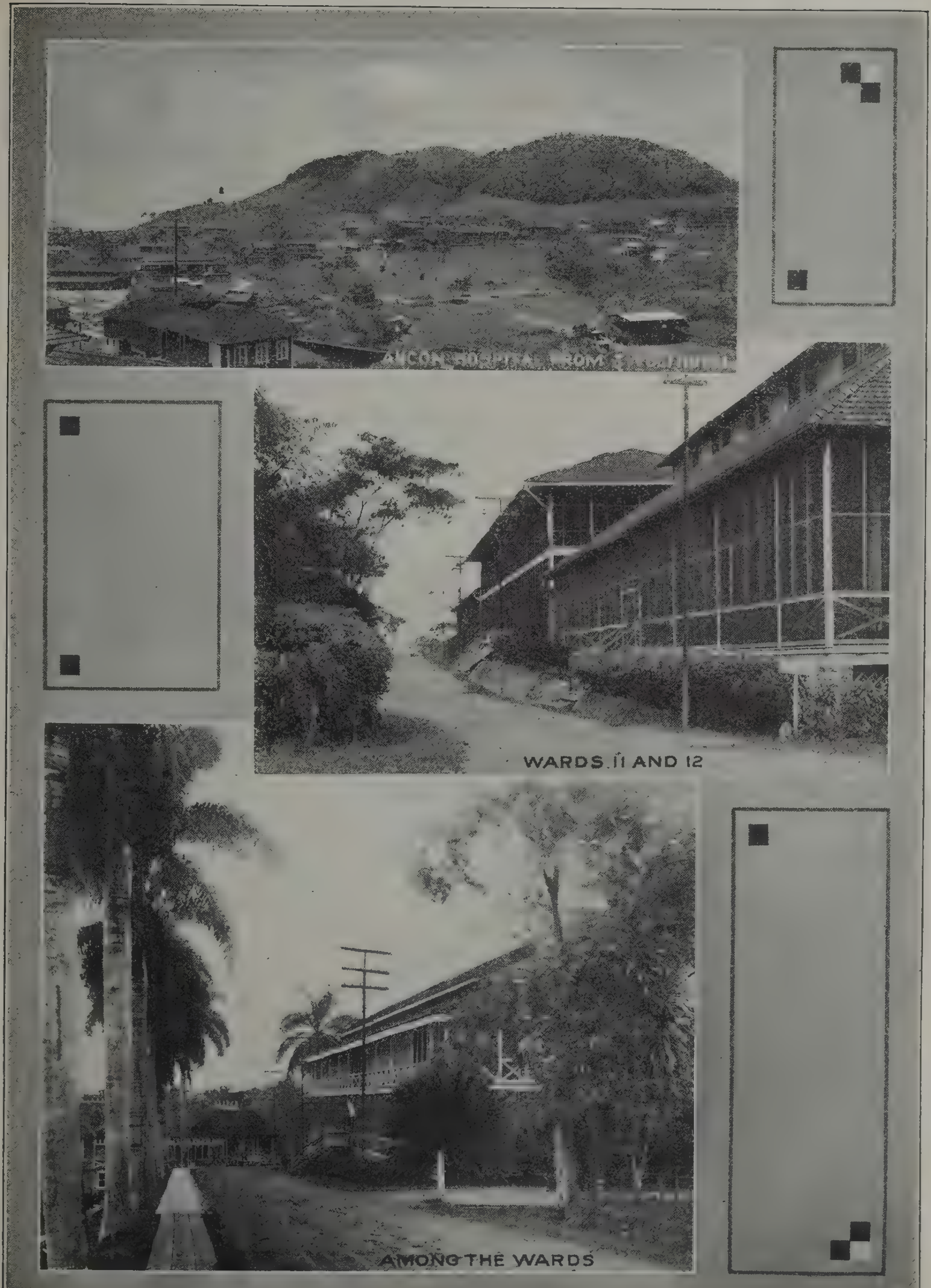
STREET PAVING

INAUGURATING WATER SYSTEM, JULY 4 1905

It took months of labor, and sortie after sortie, before the mosquito horde began to thin. A gang of about 900 natives was at one time engaged with ladders and paste, sealing all the crevices in the houses in Panama, prior to fumigation. Streets were paved, a water system installed, and a general clean-up was made.



The above comparison of—before and after paving—is not exaggerated. When the Americans took charge of the work many of the streets in Colon and Panama City were veritable bogs in the rainy season. Now, both cities compare favorably in clean, well paved streets, with others of their size.



The Government operates two main hospitals. One at Ancon and the other at Colon. The Ancon Hospital is the larger and best equipped, with a reputation in the Tropics second to none. It was begun by the French in 1883, but many improvements have been made by the Americans.

Taboga Island, 12 miles out from the main land, in Panama Bay. It is noted for its sea bathing, and its pineapples. The native section is primitive and picturesque and contains one of the oldest churches in this section.

Balboa. In case a ship arrives which cannot show a certificate that all regulations have been properly complied with before leaving Guayaquil, then it is necessary that the vessel be fumigated on its arrival at Panama, and pass through the 7-day detention period at that port. On the Atlantic side, at the present time, ships sailing from La Guaira, Venezuela, are compelled to consume seven days, and from Santa Marta, Barranquilla, and Cartagena, they are compelled to consume six days from the time of sailing. With a rigid quarantine at the two ports of the Canal, and with the effective work of the sanitary inspectors kept up as it has been in the past, it seems improbable that a serious epidemic of yellow fever will ever break out on the Isthmus again.

The Canal Commission's Sanitarium on Taboga Island, where all sick white employes are sent to convalesce. The employes are given 30 days vacation each year, with full pay, and 30 days sick leave each year, when necessary.

by Colonel Gorgas when the engineers were busy constructing water works and sewers, has freed the Isthmus of its reputation as a pest hole, and has made its sick and mortality rate compare favorably with cities in the United States, or any other parts of the civilized world. The following tables indicate the effectiveness of the preventive work of sanitation on the Isthmus:

COMPARATIVE STATEMENT OF DEATH RATES AMONG CANAL EMPLOYES ON THE ISTHMUS OF PANAMA UNDER THE ORIGINAL FRENCH COMPANY FOR 1884, THE YEAR THE MAXIMUM NUMBER OF EMPLOYES WERE WORKING, AND THE AMERICAN COMMISSION, 1904 TO 1912, INCLUSIVE.

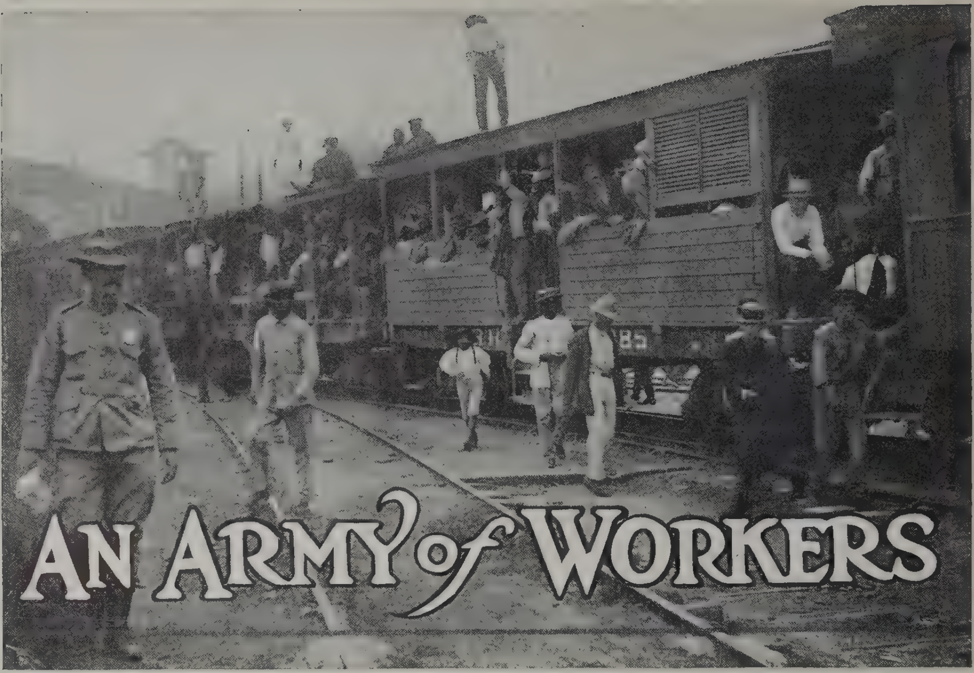
Year.	Average No. of Employes.	No. of Deaths, Disease Only.	Death Rate per 1,000 Disease Only.	Lives Saved.
1884......	17,436	1,198	68.69	......
1904......	6,213	55	8.84	422
1905......	16,512	412	24.96	722
1906......	26,547	1,046	39.40	778
1907......	39,238	964	24.57	1,731
1908......	43,891	381	8.68	2,634
1909......	47,167	356	7.55	2,884
1910......	50,802	381	7.50	3,109
1911......	48,876	374	7.65	2,983
1912......	50,893	325	6.37	3,172
Total for nine years.				18,435

TOTAL POPULATION OF PANAMA, COLON AND CANAL ZONE AND DEATH RATES IN SAME.

Year.	Population.	Annual Average Death Rate per 1000	Lives Saved.
1904.........	35,000	52.45	.....
1905.........	56,624	49.94	142
1906.........	73,264	49.10	299
1907.........	102,133	33.63	1,922
1908.........	120,097	24.83	3,317
1909.........	135,180	18.19	4,631
1910.........	151,591	21.18	4,740
1911.........	156,936	21.46	4,863
1912.........	146,510	20.49	4,682
1913 (June 30)	130,456	21.10*	4,090
Total for nine and a half years..................			28,686

*Computed on six months' figures, but averaged for a year.

Only two cases of bubonic plague have developed on the Isthmus since American occupation. These occurred in Balboa, the first in June, 1905.



AN ARMY of WORKERS

IN the month of September, 1904, the Canal force was at its lowest point, numbering about 500. In November, 1905, the force had been increased to approximately 17,000, and in November, 1906, it was practically the same. The following tables show the highest monthly record for each year since 1906:

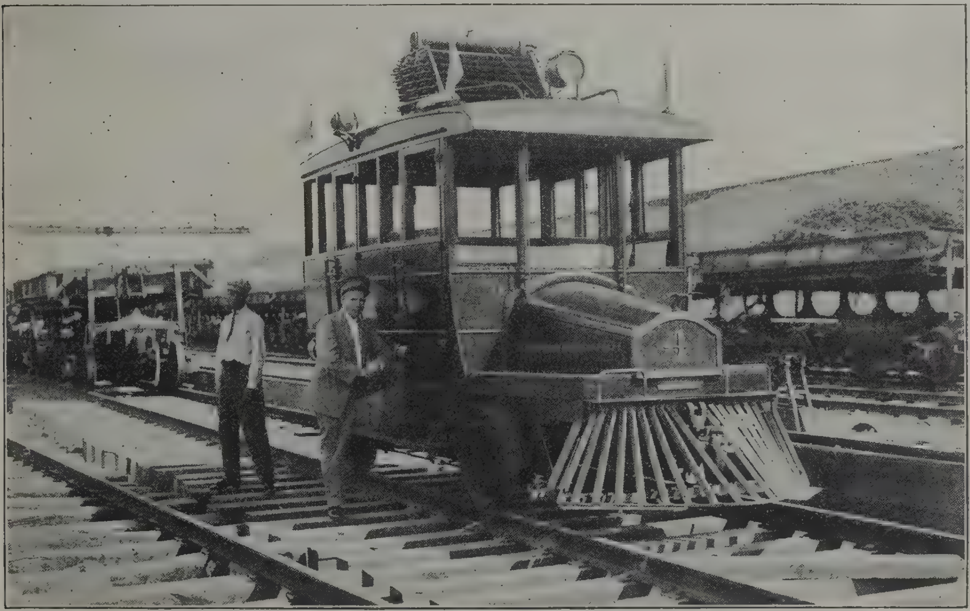
1907—October	31,967	1911—December	37,826
1908—April	33,170	1912—November	40,159
1909—October	35,405	1913—March	44,733
1910—March	38,676		

The Canal force reached its highest point in March, 1913, with 44,733 men, divided as follows: Panama railroad, 5,248; Panama railroad commissary, 1,274; Isthmian Canal Commission, 32,567; contractors, 5,644; total, 44,733.

Of the above, the "gold" force, composed almost entirely of Americans, numbered 4,487; West Indian laborers employed by the Commission, 10,406; West Indian artisans employed by the Commission, 13,065; European laborers employed by the Commission, 4,609. The balance was in the employ of the Panama railroad and of the contractors. Most of the West Indian laborers received 10 and 13 cents an hour, while a few received as high as 20 cents an hour. The European laborers received 16 and 20 cents an hour. The West Indian artisans were for the greater part paid on a monthly basis, the balance receiving from 16 to 44 cents an hour.

GETTING THE FORCE TOGETHER

As the work of making the Isthmus a healthful place in which to live progressed and better living conditions were inaugurated, the work of recruiting and maintaining a labor force became easier. However, it was never possible to keep a stable force and, under the best conditions, the American force changed considerably, the skilled mechanics about 80 per cent. during the year 1910, and that of the administrative employes about 45 per cent. During the early years, recruiting offices were opened in Europe, the West Indies and in the United States, and men representing nearly every nationality were brought to the Isthmus under contract with the Commission. Nearly all the supervisory positions, and the positions requiring skilled labor, are filled by Americans. These include the mechanics, carpenters, plumbers, steam shovel engineers and cranemen, locomotive engineers, railroad conductors, firemen, policemen, civil engineers, clerks, doctors, nurses, school teachers, etc. The clerical force, draftsmen, doctors and nurses are included in the classified civil service, but all other positions are excepted from civil service requirements. The common and unskilled laborers represent nearly every nationality. The greater part, however, are negroes from the West Indies; the Spaniards, Italians and Greeks form the greater part of the European labor force.



Colonel Goethal's motor car, commonly known as the "Yellow Peril" from its color; also as the "Brain Wagon." Several of these cars have been shipped to the Isthmus, and are used by the officials in inspecting the different parts of the work.

During the years 1906-7-8, there were recruited in Europe 11,300 laborers, 8,200 of which were Spaniards, 2,000 Italians and 1,100 Greeks. These men were obtained under contract, and were promised free quarters and employment at 20 cents an hour for as long as the canal work should last. Their passage money was advanced to them, and was deducted from their monthly pay, so that out of a total cost of $508,770.83 for recruiting Europeans, all but $100,000 was returned from the laborers' wages. Recruiting ceased in Europe in 1908, as the supply of labor became constant through the arrival of those on the Isthmus who, having learned of the favorable working conditions, came seeking employment of their own volition. Those who did not come under contract were paid 16 cents an hour for three months, and were then raised to 20 cents an hour if their work had been satisfactory. Laborers obtained under contract will be repatriated at the expense of the Commission, but their number will not be large as, undoubtedly, many of them will find work elsewhere.

The recruiting of laborers in the West Indies was carried on several years after it had ceased in Europe, the last importation of negroes from Barbados having taken place in January and February of 1913. The total number of West Indians recruited reached 30,619 at the end of 1912. Of this total, 19,444 were brought from Barbados, 5,542 from Martinique, 2,053 from Guadeloupe, 1,427 from Trinidad, and the balance distributed among the other islands of the West Indies. Recruiting of laborers was not allowed in Jamaica after 1905, in which year 47 had been brought to the Isthmus under contract. Although this class of laborer was not recruited, he is well represented on the Isthmus in the labor force, for the Jamaican came of his own volition although he was required to deposit the amount of his return fare before he could leave that island. In October, 1913, about 10,000 West Indians were laid off as the dry excavation in Culebra Cut came to an end. About 5,000 of these men will go into the employ of the United Fruit Company and the balance, which are unable to find work elsewhere, will probably go back to their island homes.

Colonel Goethal's residence at Culebra.

KEEPING THE AMERICAN EMPLOYES CONTENTED

In addition to much higher wages than those prevailing in the United States, many inducements were offered to persuade Americans to go to the Isthmus to fill the supervisory positions. Free quarters, free medical, surgical, and hospital attendance, and six weeks' annual leave of absence with pay are provided. Free transportation is also furnished new employes from the United States and also on their return after having completed two years of satisfactory service on the Isthmus. On their vacation leave, the employes are granted a reduced rate on the various steamship lines running between the Isthmus and the United States. On the Panama railroad steamships the employes' rate is $20 one way for those appointed prior to January 1, 1909; for employes appointed after that date, the rate is $30; the regular rate is from $75 to $90 from Colon to New York.

The problem of maintaining a constant force of Americans was not solved, however, until means were found to keep it as nearly contented as possible. To do this, it was thought necessary to encourage employes to bring their families to the Isthmus, and to this end, furnished family quarters were provided, with free fuel, water, and light. It is generally agreed that the comfortable married quarters supplied by the Canal Commission has led a good many to forsake the state of single blessedness, but nearly all are wise enough to wait for an assignment before "popping the question." The demand for family quarters has always been greater than the supply, and one has to take his turn on the waiting list. If he is an old-timer and has not been out of the service since 1908, he is on what is known as the No. 1 list, and stands a fair show of getting quarters quickly. One who has been employed since 1908 goes on the No. 2 list, and there is generally several months' weary wait before his turn comes, as the total number of applicants up to the latter part of 1913 had been rarely less than 600. Some insist on bringing their families anyway, in

Owing to the necessity of building on the side of the hill at Ancon, many steps are required at some of the quarters, as shown in the above picture. Usually more level sites were utilized for quarters. The houses, with the surrounding shrubbery, make a beautiful scene.

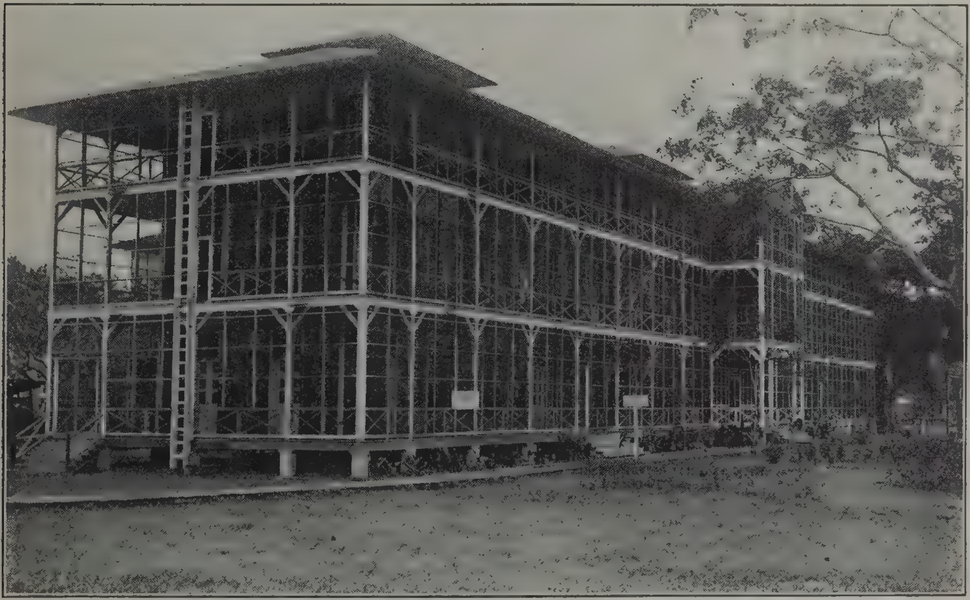
employes who entered the service in the year 1904. Another is called the Society of the Chagres, and is composed of men who have seen six years of service. A third society has recently been organized, known as the Association of Panama Canal Builders, to which any gold employe may belong.

A lunch hour scene at Gorgona shops, before they were destroyed to avoid inundation by the rise of Gatun lake.

All gold employes who have served two years under the Canal Commission are entitled to a medal. This souvenir is the outcome of the thoughtfulness of ex-President Roosevelt, who, just before he sailed from the Isthmus on November 17, 1906, said: "I shall see if it is not possible to provide for some little memorial, some mark, some badge, which will always distinguish the man who, for a certain space of time, has done his work well on the Isthmus, just as the button of the Grand Army distinguishes the man who did his work well in the Civil War." The medal is of bronze, one and one-half inches in diameter, and is made from brass, copper, and tin taken from old French scrap. On the reverse side is a bust portrait of ex-president Roosevelt, with

Labor train arriving at dry dock, Cristobal. A great many employes live at a distance from their work, and are transported to and from their homes in labor trains.

roasting, ice cream and laundry plants, and a bakery are operated at Cristobal. From this point a supply train, partly composed of refrigerator cars, crosses the Isthmus each morning, stopping at the different stations along the line where ice, meats, and other perishable articles are delivered. These goods are then distributed to the houses of employes and to the mess halls and branch commissaries by the Quartermaster's Department. No cash sales are made, all payments being made by the employes in the form of coupons ranging in value from one cent to 25 cents from books issued ranging in value from $2.50 to $15. The same method of payment is used in the hotels. These books are obtained by the employes for cash at stated places, or are supplied by the timekeepers, and the amount deducted from the employes' salary at the end of the month. They are not transferable, and in order that the privilege will not be abused, infractions of this rule is punishable by confiscation of the book and ten days' suspension for the first offense, and discharge for a second offense.



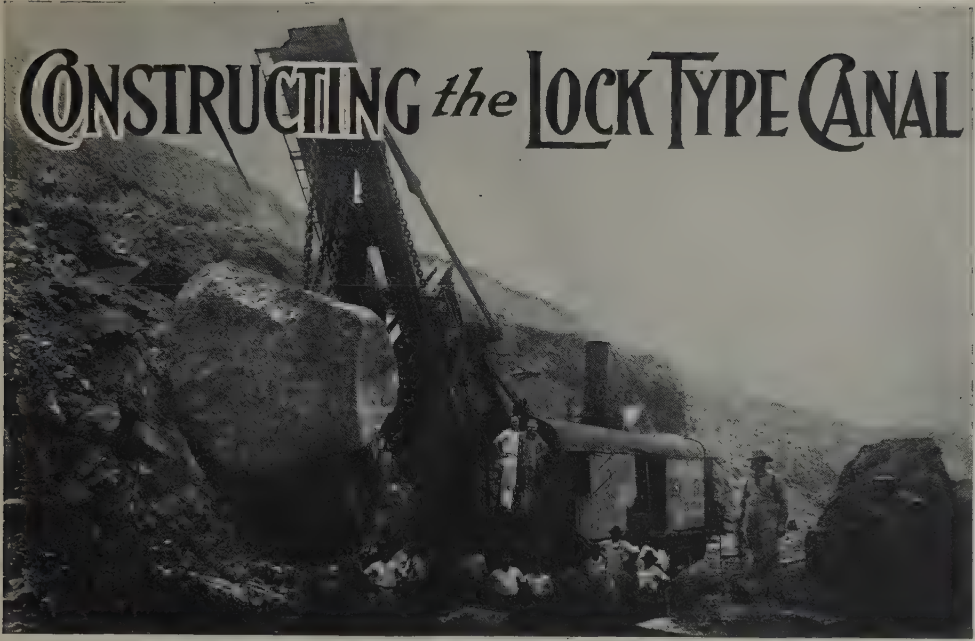
The Government hotel at Corozal, the first one erected by the Americans. These Government hotels are established in all of the Zone settlements. In them a white employe is served a better meal for 30 cents than he can usually procure for that price in this country. In one part of the dining room, employes are permitted to eat without their coats; in the other they must keep them on.

Due to the fact that the commissaries are not run for a profit, except to cover in the cost of the various plants, improvements, etc., and to the fact that the Government buys in large quantities under favorable contracts, the consumers on the Isthmus have not felt the high cost of living to the extent of people elsewhere. This is especially true of beef, the price of which during 1912 reached a point never before equalled in the United States. With but a few exceptions, the price of beef at the commissaries during this period was kept down to the previous price. During a single year, 6,453,138 pounds of fresh

School for white children at Empire. Twelve white and fifteen colored schools are maintained. The white schools are in charge of women teachers from the United States; the colored schools are taught by male West Indians.

Ancon high school class, term of 1912-13. There are two high schools for advanced scholars.

CONSTRUCTING the LOCK TYPE CANAL



THE idea of a lock and lake level canal was not a new one, for it was first suggested in the engineering congress convened in Paris in 1879, at which the French adopted the sea level plan. At this congress, Godin de Lepinay outlined the essential features of the canal as it is today, a lake level with a dam across the Chagres at Gatun. Again, when it became evident in 1887 that the sea level canal could not be completed by the old French Canal Company, a temporary lock plan was adopted. When the United States took over the work in 1904 no plan had been determined upon. To decide this question, ex-President Roosevelt, under date of June 24, 1905, created an International Board of Consulting Engineers, consisting of 13 members as follows: Gen. George W. Davis, Chairman, Alfred Noble, one of the constructing engineers of the Soo canal; William Barclay Parsons, engineer of the New York underground system; William H. Burr, professor of engineering in Columbia college; Gen. Henry L. Abbott, army engineer, whose observations on the topography and characteristics of the canal territory were valuable; Frederic P. Stearns, hydraulic engineer of Boston; Joseph Ripley, at one time chief engineer of the Soo canal, and afterwards employed by the Isthmian Canal Commission as lock expert; Herman Schussler, Isham Randolph of Chicago Drainage Canal fame; W. Henry Hunter, chief engineer of the Manchester ship canal, representing the British Government; Eugen Tincauzer, chief engineer of the canal at Kiel, representing the German Government; Adolphe Guerard, civil engineer, representing the French Government; Edouard Quellennec, consulting engineer of the Suez Canal, and J. W. Welcker, engineer and constructor of the North Sea canal, representing the Holland Government. This board, on January 10, 1906, submitted two reports, a majority report, signed by eight members of whom five were the representatives of foreign governments, favoring a sea level canal, and a minority report, signed by five members, all of whom were Americans, and in what has been actually demonstrated in making and operating the great lock canal, the Soo, a more important artery of traffic than the great sea level canal, the Suez, goes to support the opinion of the minority of the Consulting Board of Engineers and of the majority of the Isthmian Canal Commission as to the superior safety, feasibility, and desirability of building a lock canal at Panama."

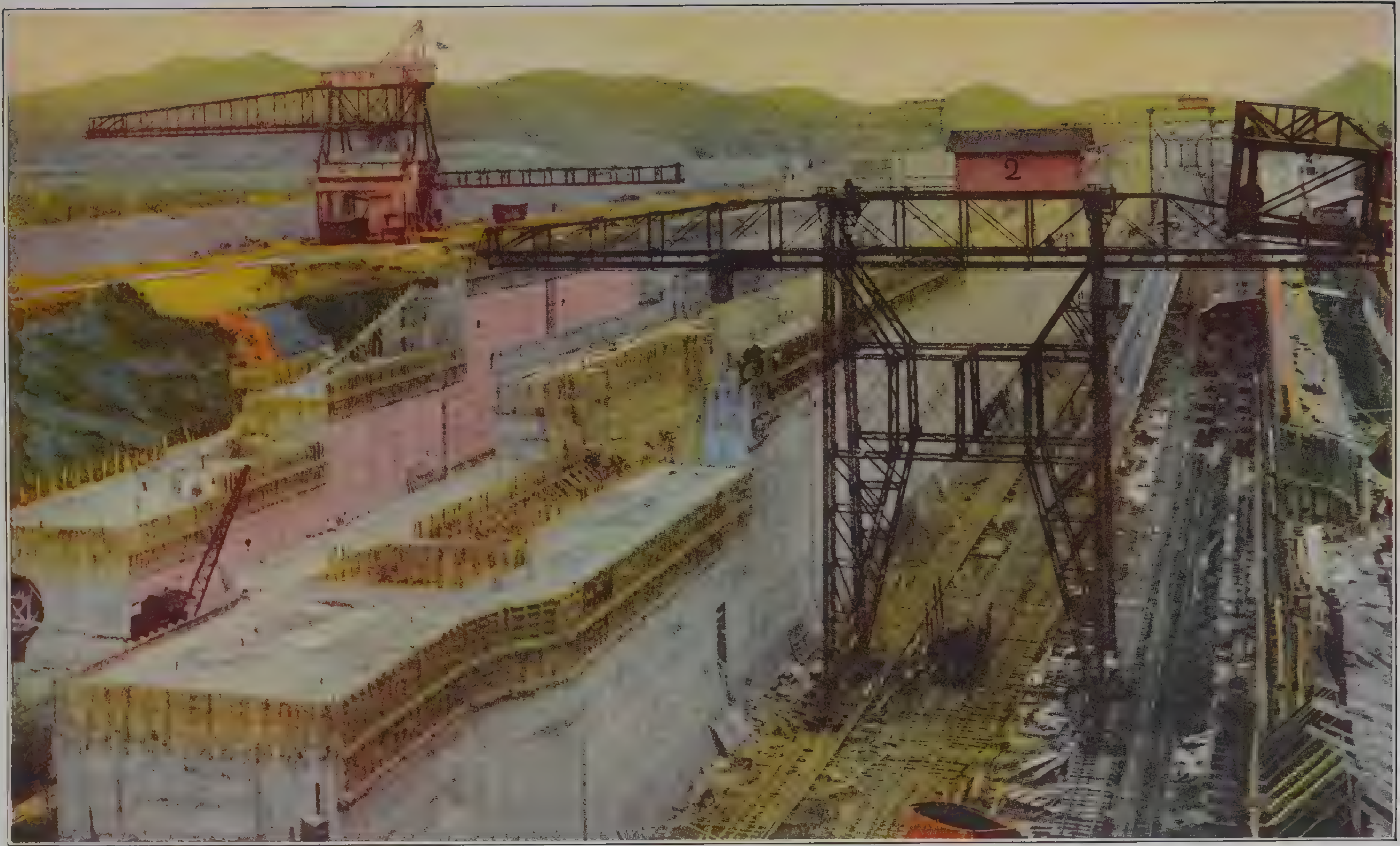
Congress on June 29, 1906, decided upon a lock canal at an elevation of 85 feet. That this was the best plan to pursue has been proved by experience with slides which added greatly to the estimated amount of excavation necessary under either plan.

THE CANAL A WATER BRIDGE

The completed canal is virtually a water bridge over which ships will pass from ocean to ocean. There was no mating of the Atlantic with the Pacific when the dike at Gamboa was destroyed on Friday, October 10, 1913, and the waters of Gatun Lake were allowed to flow into Culebra Cut, for lake and Cut are, at the surface of the water, 85 feet above the level of the sea. From deep water in the Atlantic to deep water in the Pacific the Canal is about 50 miles long; from shore line to shore line it is about 40 miles long. It does not, as is quite generally thought, cross the Isthmus from east to west. Its general direction is from northwest to southeast, and the city of Panama at the Pacific entrance is about 22½ miles southeast of Cristobal at the Atlantic entrance.

Early subsidence in Gatun Dam. This occurrence caused the sensational stories in the newspapers in the United States in 1908, to the effect that the Dam had sunk and that the foundation was unsuitable for such a massive structure. The completed Dam demonstrates that the statements were entirely unfounded, and that it is as effective a water barrier as the age-old hills upon which it abuts.

Starting in the Atlantic, a vessel enters a sea level channel 500 feet wide to Gatun, a distance of seven miles, where it will be lifted by a flight of three locks, or immovable water elevators, having a combined lift of 85 feet, to the level of Gatun Lake. The lake proper to Bas Obispo, the beginning of Culebra Cut, the man-made pass through the continental divide, is about 24 miles long, and the channel through it varies from 1,000 to 500 feet in width, with a water depth



A comprehensive view of one of the great locks of the Canal under construction, where the largest concrete monoliths in the world have been built. One is almost bewildered by the tremendous machinery of the work—the enormous Berm and Chamber cranes with their almost uncanny air of intelligence towering over the scene with their interlaced-ironwork arms extended above the cement walls which they are constructing.

from 85 to 45 feet. While in the lake a vessel may steam at full speed. The channel through Culebra Cut as far as Pedro Miguel, nine miles, narrows to 300 feet, the minimum bottom width of the Canal. At Pedro Miguel, the vessel is ready to begin the descent to the Pacific. There is a single lock here, which lowers the vessel 30⅓ feet to a small artificial body of water called Miraflores Lake, which is about 1½ miles long and 54⅔ feet above sea level. The final descent to sea level is made at Miraflores by a flight of two locks. The vessel has now passed over the bridge, and is ready to proceed through a sea level channel 8½ miles to deep water in the Pacific. This channel, like the one on the Atlantic side, has a bottom width of 500 feet, but its depth is 45 feet at mean tide, instead of 41 feet. This difference in the depth of the two sea level approaches is due to the fact that it is necessary to partly counteract a maximum tidal oscillation in the Pacific of 21 feet; that in the Atlantic is but 2½ feet; the mean sea level is the same in both oceans.

THE DAM AT GATUN

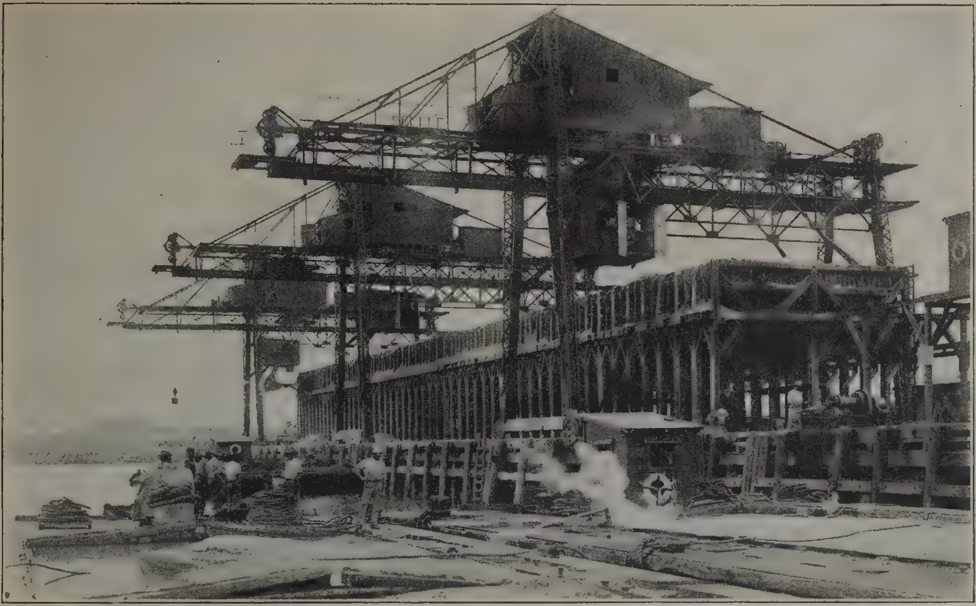
When plans for a sea level canal were under consideration, one of the hardest problems to solve was the diversion of the Chagres River. Now, however, with a lock canal, the Chagres is the key to the situation. By placing a dam across the lower end of its valley, its water and that of its tributaries have been impounded to form Gatun Lake. The dam is, in reality, a low ridge of earth connecting the hills on either side of the valley, and looks as though it had been placed there by nature rather than by the efforts of man. It is 1½ miles long, 105 feet above mean sea level, or 20 feet above the normal level of the lake, and tapers from nearly ½ a mile wide at its base, to about 100 feet wide

Water from the lake flowing over the spillway, during the rainy season, before it was completed. The spillway will control the rise and fall of Gatun Lake.

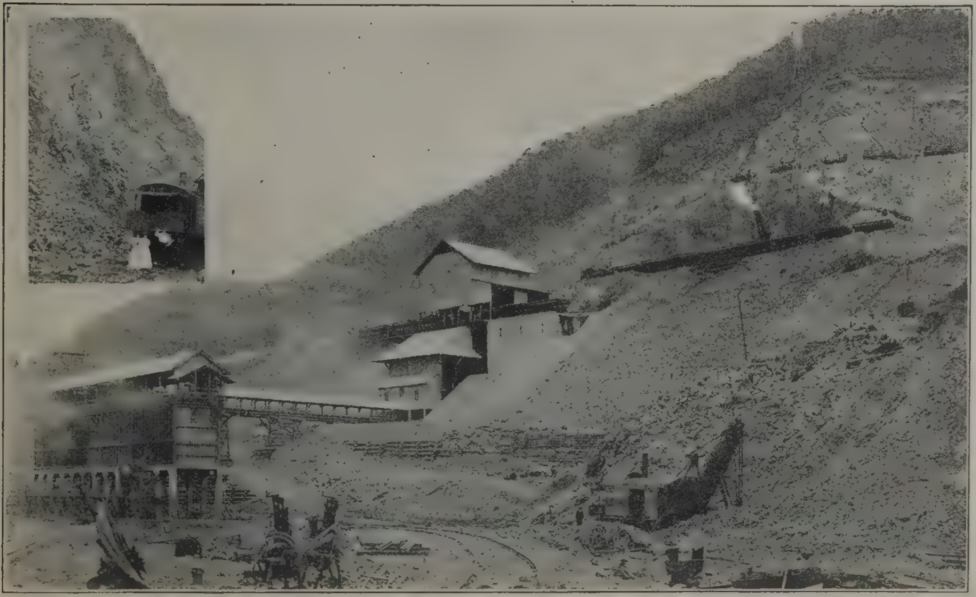
Excavating for lock site, Gatun.

Excavating for lock site, Pedro Miguel.

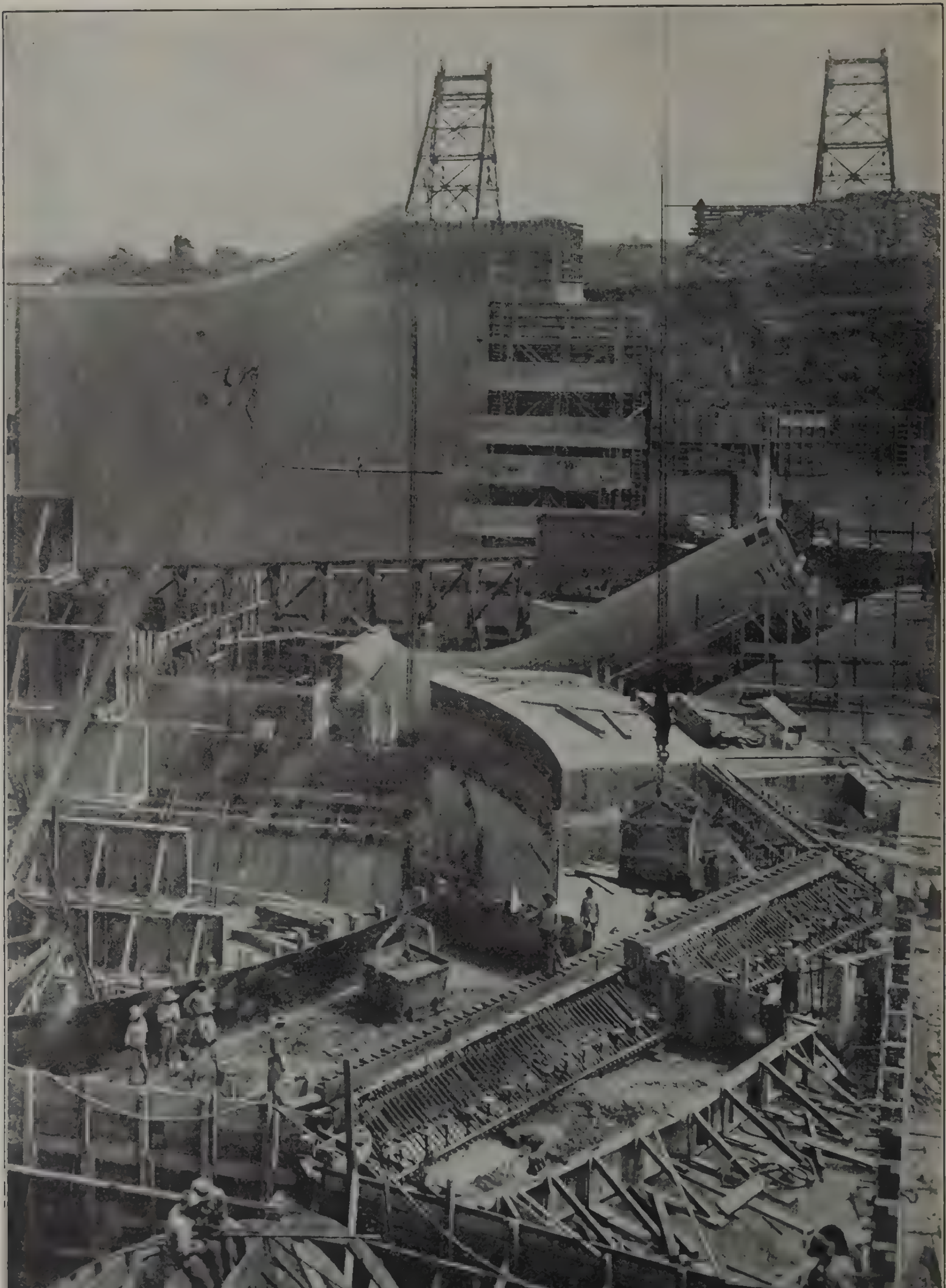
Excavating for lock site, Miraflores. Millions of cubic yards of material had to be excavated before the locks were built.



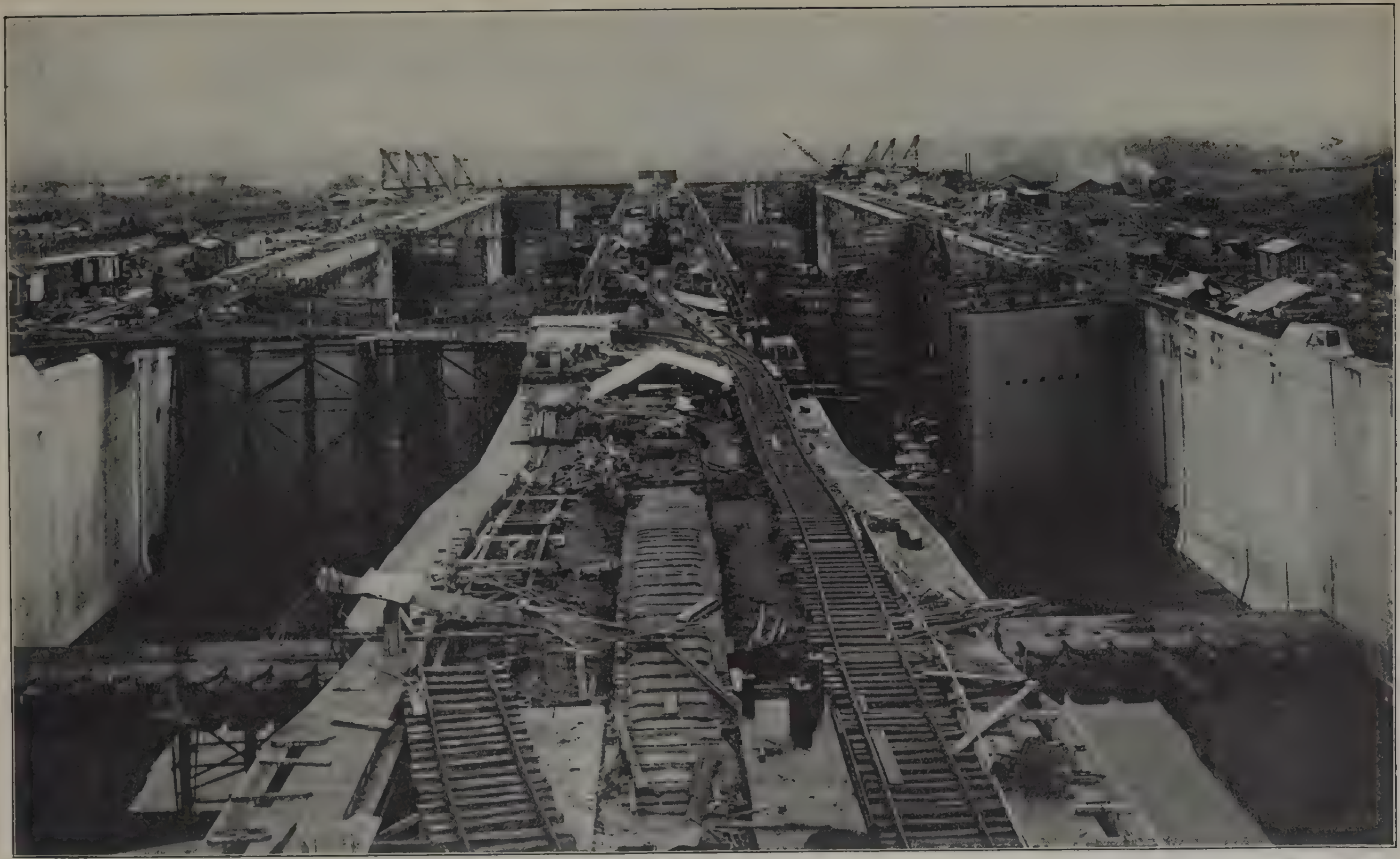
Sand bins and unloading cranes at Balboa. Sand for the concrete used in the Pedro Miguel and Miraflores locks was obtained from Punta Chame, about 25 miles along the Pacific coast from Balboa. It was towed to Balboa in barges, lifted into the bins by the unloading cranes and when needed was dumped from the bins into cars and hauled to the lock storage piles.



Ancon rock crusher plant and quarry, between Panama City and Balboa, where the crushed rock was obtained for the concrete used in the Pacific locks. The side of the hill has been literally eaten away to secure the large amount of rock required.

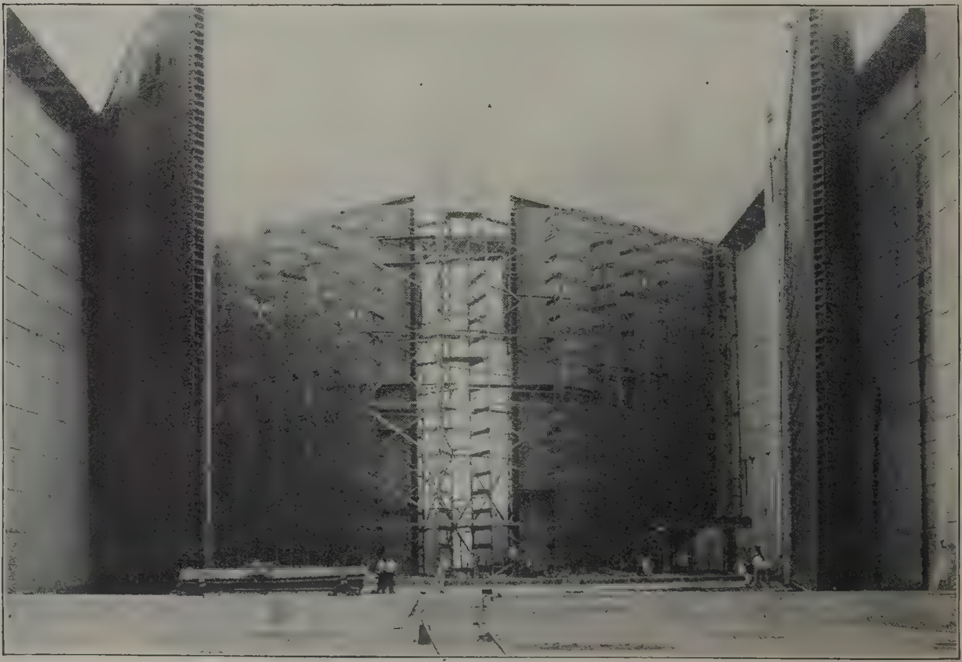


This view shows the dumping of concrete at Gatun Locks. Every move of the bucket is at the will of the man stationed in the cableway tower, who, in dumping, follows the signals of the man supervising the operation. As fast as the concrete is deposited, men, standing knee deep in the mixture, spread it out evenly.

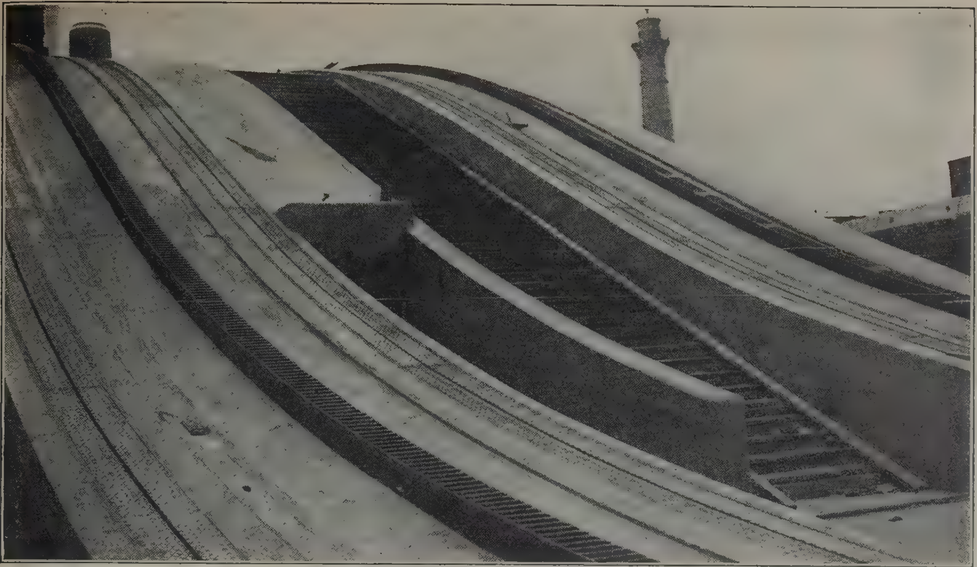


A general view of Gatun Locks as they appeared October 1, 1912. All heavy masonry work, with the exception of the north approach wall was completed, and this view gives an idea of their magnitude. Each lock contains two parallel chambers separated by a center wall. The side walls are 45 to 50 feet wide at the floor level, and narrow to a width of 8 feet at the top. The middle wall is 60 feet wide and 81 feet high.

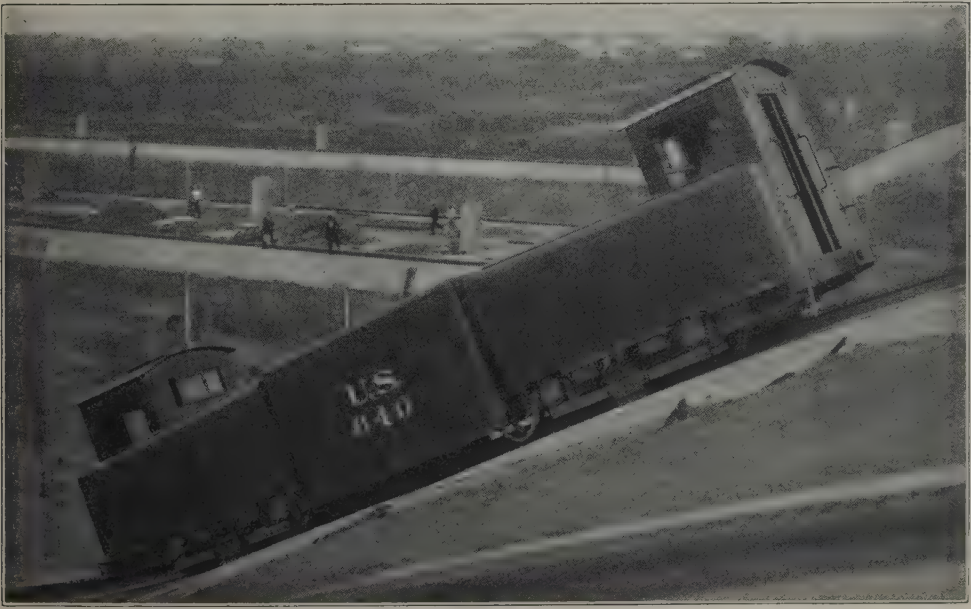
Entrance to Gatun Locks from the lake. Gatun Dam on the left and approach wall in the foreground. Approach walls 1,000 feet long, have been built at each end of all the locks, and as the name indicates, they serve as a guide to ships coming up the approach channel. Ships must come to a stop at these walls, until the locks make fast their lines.



View of the upper gates at Miraflores Locks under construction. The first of these is completed and partly swung open to full view giving an idea of their thickness. The gates are operated by electricity and may be opened or closed in one minute and 47 seconds.



Section of lock wall showing the rack rail over which the towing locomotives travel.



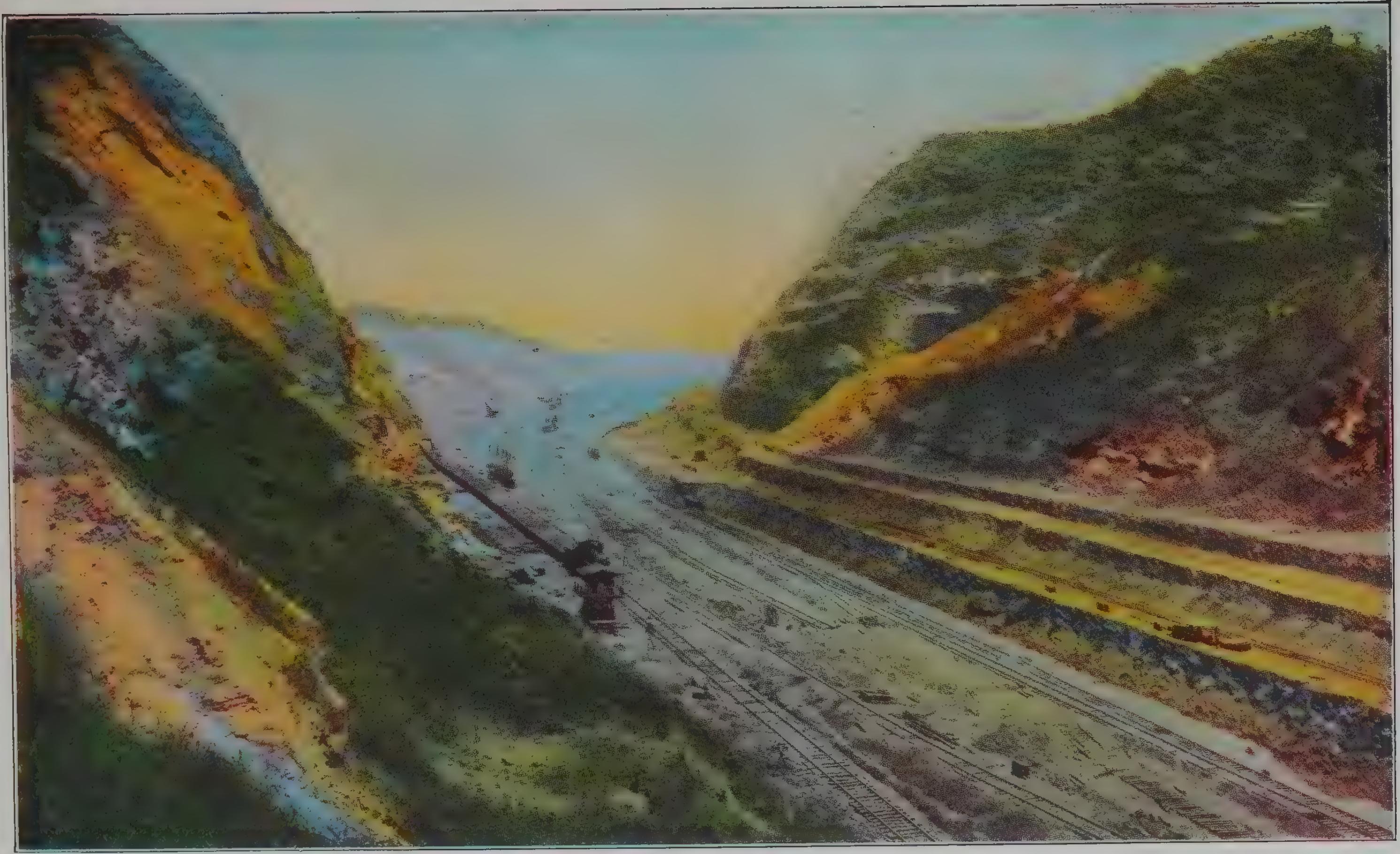
Towing locomotive in operation at Gatun Locks. These machines are designed to tow vessels through the locks. There will be two locomotives ahead towing, and two astern to retard the vessel's progress if required. In towing, they will not move faster than two miles an hour, but a second or return track, permits them to go back at greater speed.

"On they struggled, ever onward,
Blasting stone, and earth and men;
Filling rivers with razed mountains;
Filling graves with parts of men.
Blood and bone are mixed with concrete,
Sweat of brow and grime of toil
Mark the rough-neck as he swelters,
Weary 'mid the grease and oil.
Weary flesh, nor fever's terrors
Halt them as they onward go.
Forward! Forward! Ever Forward!
Is the only cry they know."
—*John Hall.*

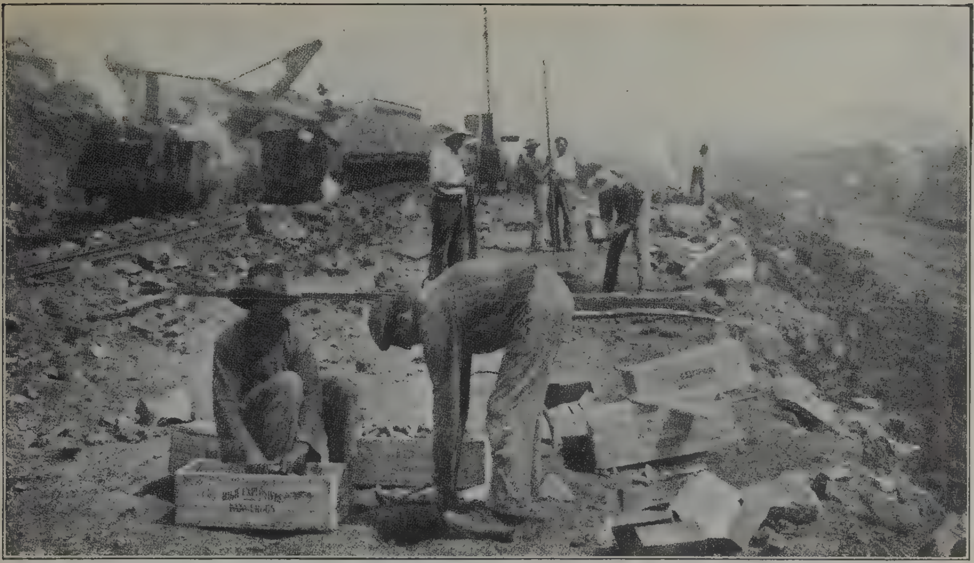
SEVENTY MILLION POUNDS OF DYNAMITE

The greater part of the material excavated by the Americans in Culebra Cut before the dredges were introduced consisted of hard rock, and it was necessary to drill and blast it before it could be handled by the steam shovels. About 50,000,000 pounds, out of a total of about 70,000,000 pounds for the entire Canal was used. When it is considered that nearly three cubic yards of

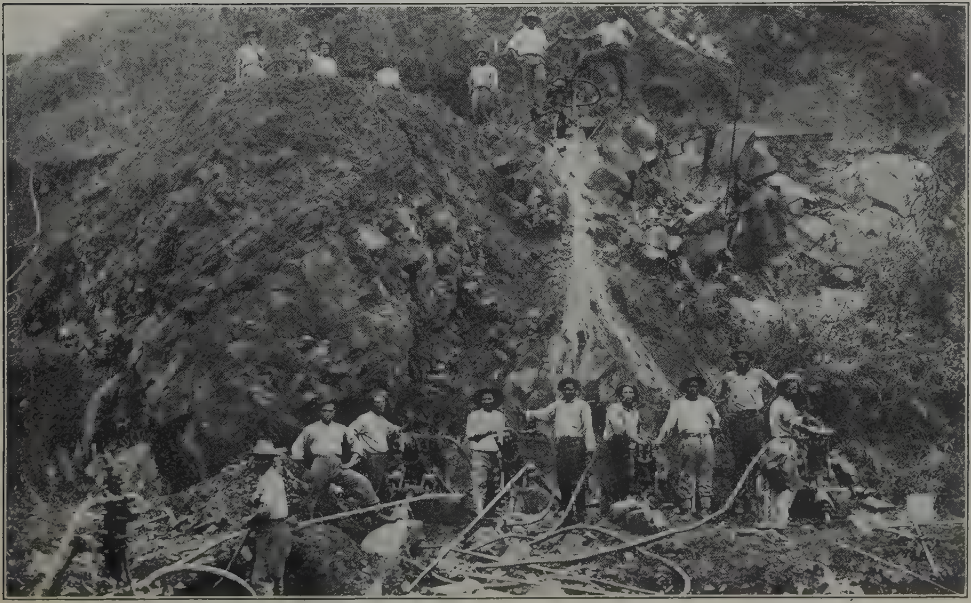
The scene of a premature explosion of nearly 22,000 pounds of dynamite at Bas Obispo, December 12, 1908. About 50 men were injured and 26 were killed, among them being three Americans. Blasting operations are conducted with great care, and the heavy shots are usually fired off after the men have quit work for the day, although several of these premature explosions have occurred.



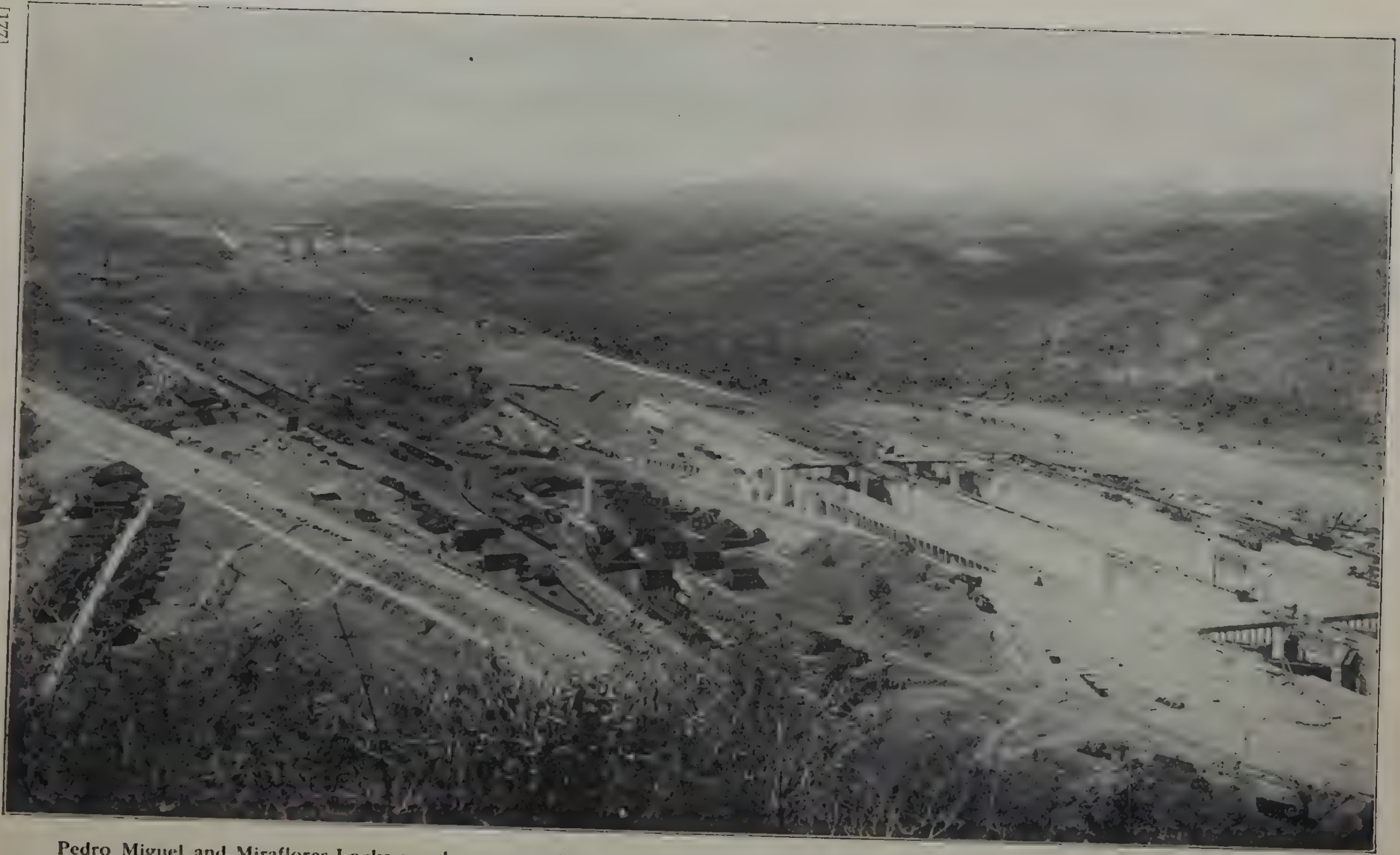
Culebra Cut looking north from Gold and Contractor's Hills. This great gash on the face of nature, which severs the continental backbone, has been, and probably always will be, the spectacular feature of the Canal. When the French first started work, the peak of Gold Hill was 534 feet above sea level and the greater part of excavation by steamshovels has been confined to this section.



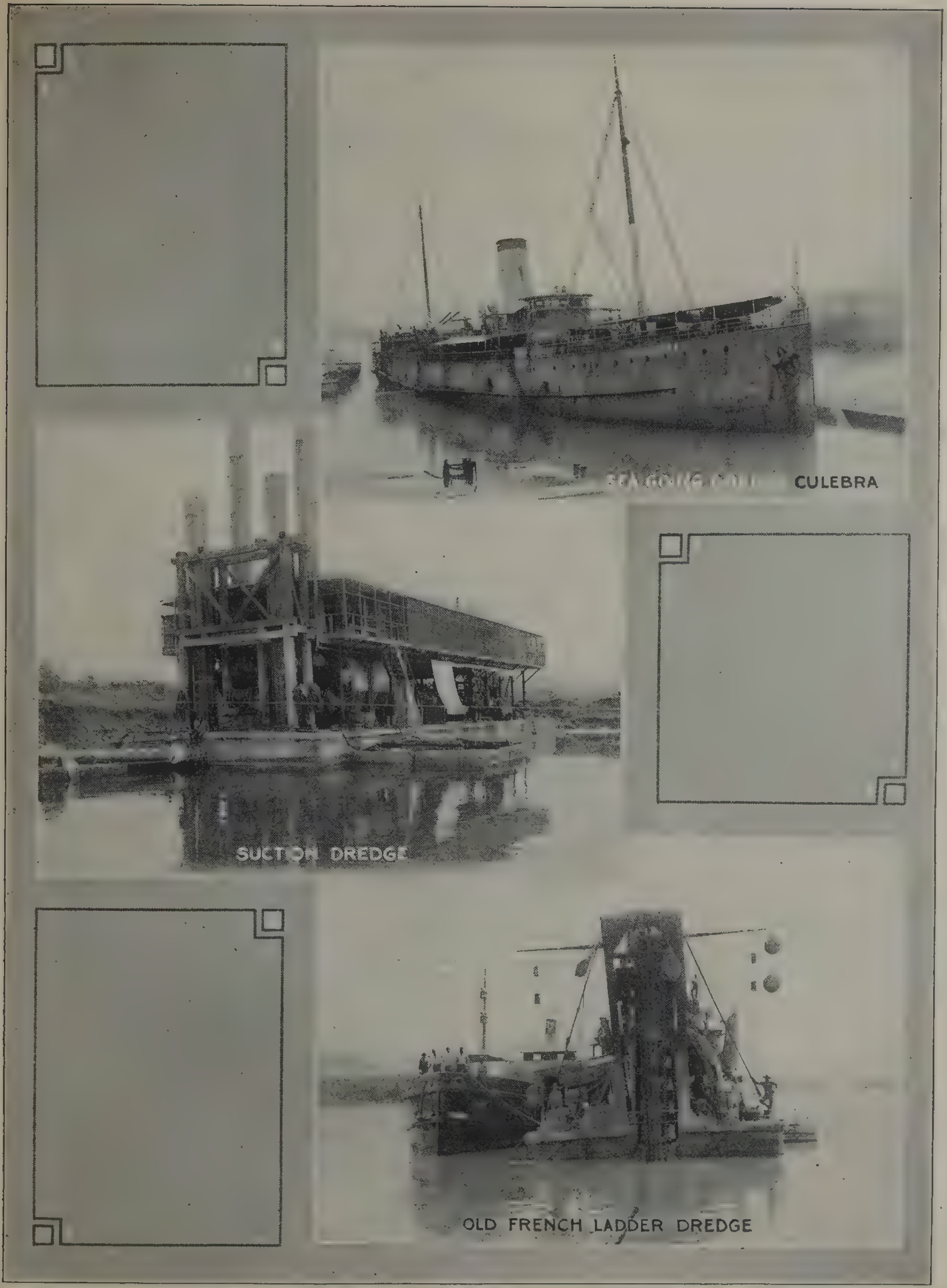
Laborers loading well-drill holes with dynamite near Contractor's Hill. A small charge is first exploded, enlarging the hole at the bottom. Then the main charge, usually consisting of from 75 to 200 pounds is placed, and exploded by means of an electric light wire.



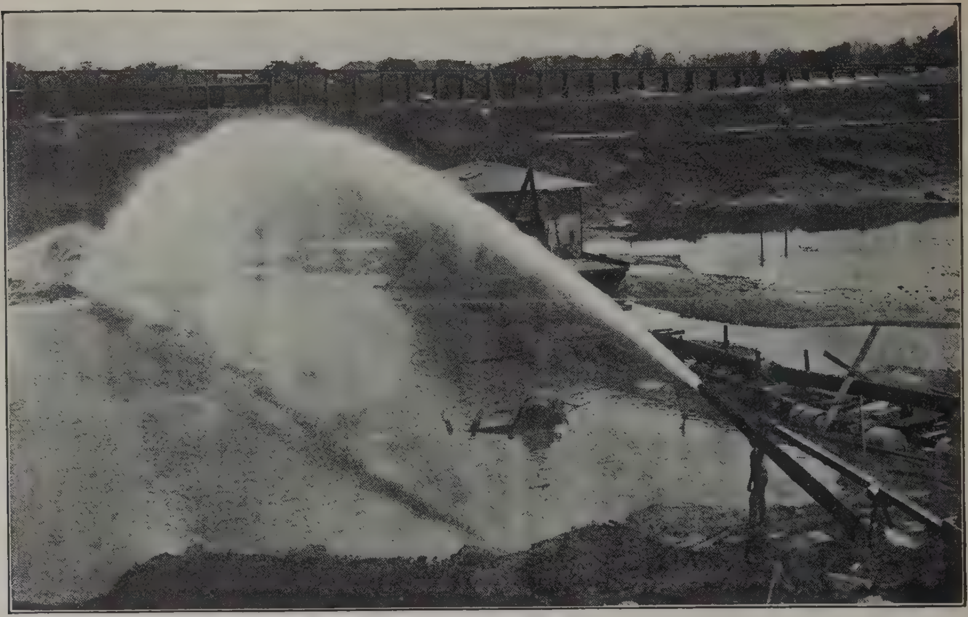
A group of tripod drills at work. Churn drills are used also. All drills are operated by compressed air supplied through mains, and an average of 75 miles of drill holes is sunk each month.



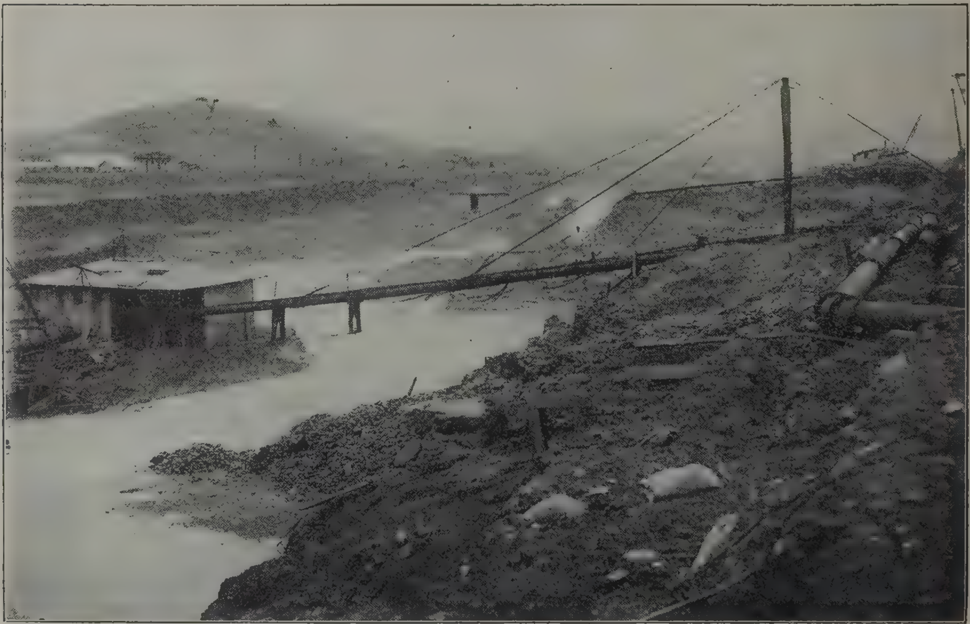
Pedro Miguel and Miraflores Locks are about one and one-half miles apart. This birdseye view gives an idea of their relation to each other. The Pacific entrance to the Canal and Ancon Hill may be seen in the distance. The newly relocated line of the Panama Railroad, which divides the town of Pedro Miguel into two parts, is visible in the foreground at the left of the locks. The space between the two locks is now filled with the water of Miraflores Lake.



The sea going suction dredge Culebra, shown above, with its sister vessel, the Caribbean, constitute the most expensive units in the Commission's dredging fleet. These vessels move up and down the channel, sucking up the mud and loose material, conveying it into their own hoppers. When the hoppers are filled, the vessels go out to sea and empty. The suction dredges were used to advantage in the fill at Gatun Dam. Several of the old French dredges were repaired and used by the Americans.

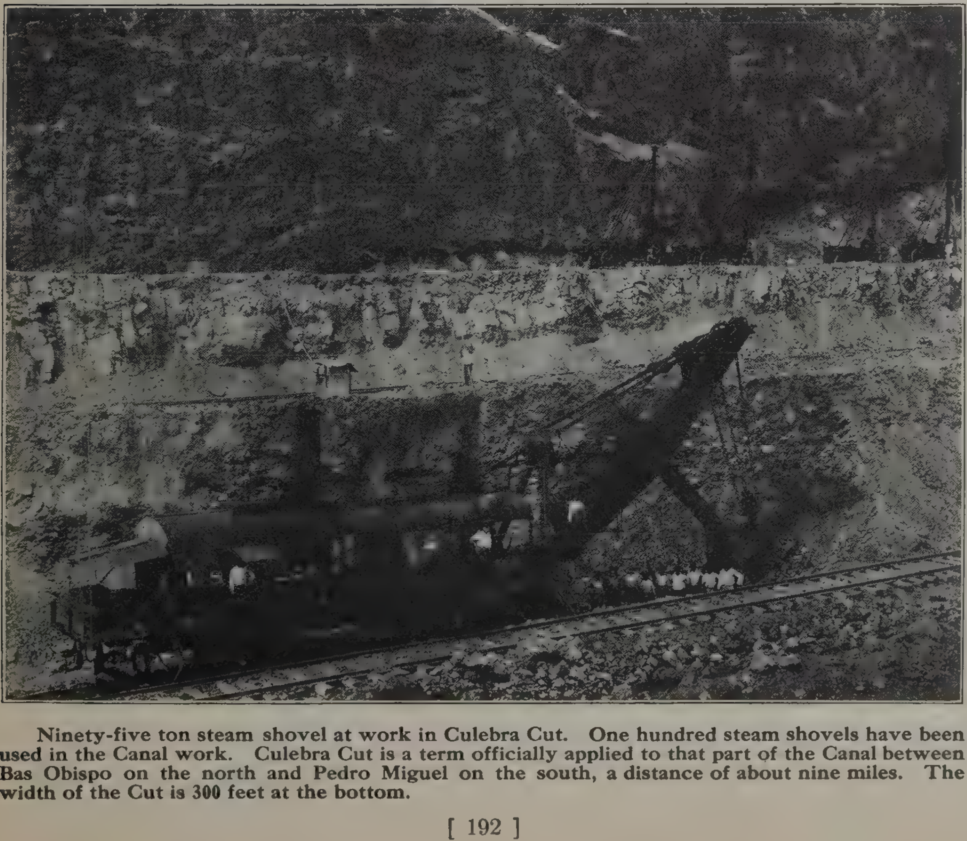


Part of Miraflores lock site and the Canal channel to the south of it were excavated hydraulically. This view shows one of the hydraulic pumps forcing the water through pipes, fitted with monitors, with a pressure of 130 pounds per square inch at the nozzle, which washes the material into pits or sumps.

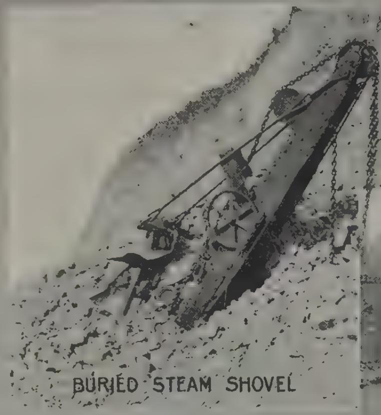


After the material has been loosened and washed into the sumps, centrifugal dredging pumps, shown here, force the material to the desired destination. Many acres have been reclaimed near Corozal by utilizing this excavated material.

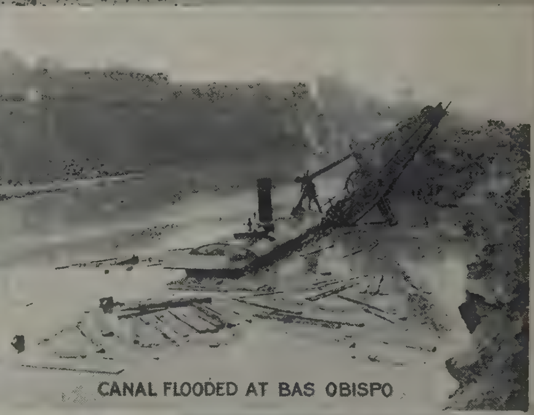
A close view of the suspension bridge across the Canal near Empire. This bridge is used for vehicles and foot passengers, but will be taken down when the Canal is completed. There will be no bridge aross the Canal, except the pontoon bridge near Paraiso, which will be swung over against the east side of the Canal when not in use.



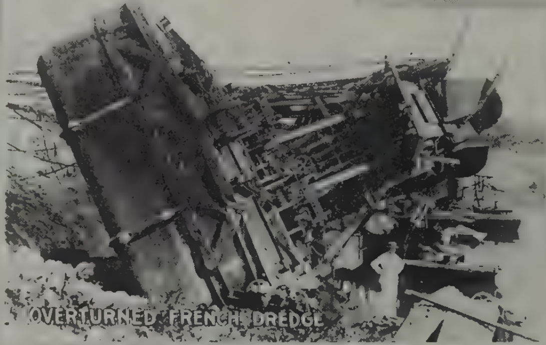
Ninety-five ton steam shovel at work in Culebra Cut. One hundred steam shovels have been used in the Canal work. Culebra Cut is a term officially applied to that part of the Canal between Bas Obispo on the north and Pedro Miguel on the south, a distance of about nine miles. The width of the Cut is 300 feet at the bottom.



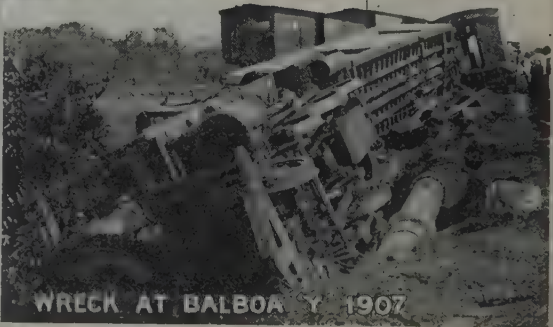
BURIED STEAM SHOVEL



CANAL FLOODED AT BAS OBISPO

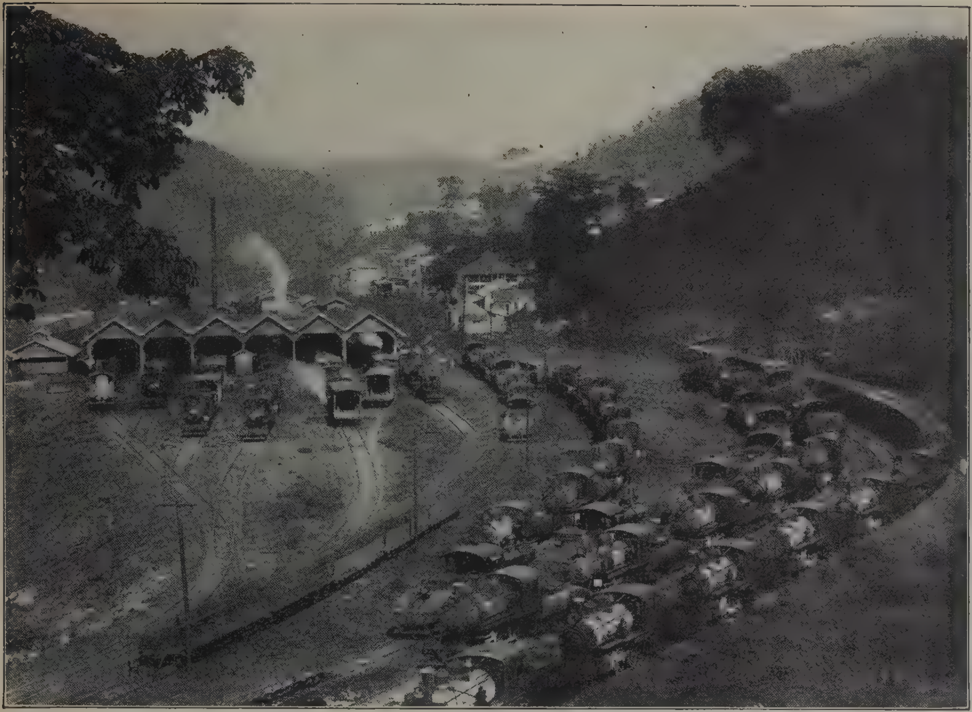


OVERTURNED FRENCH DREDGE

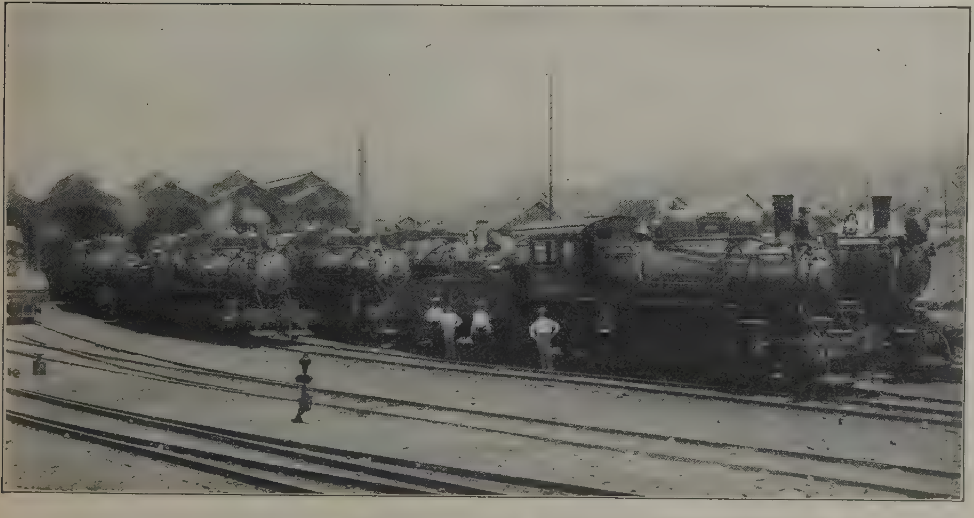


WRECK AT BALBOA Y 1907

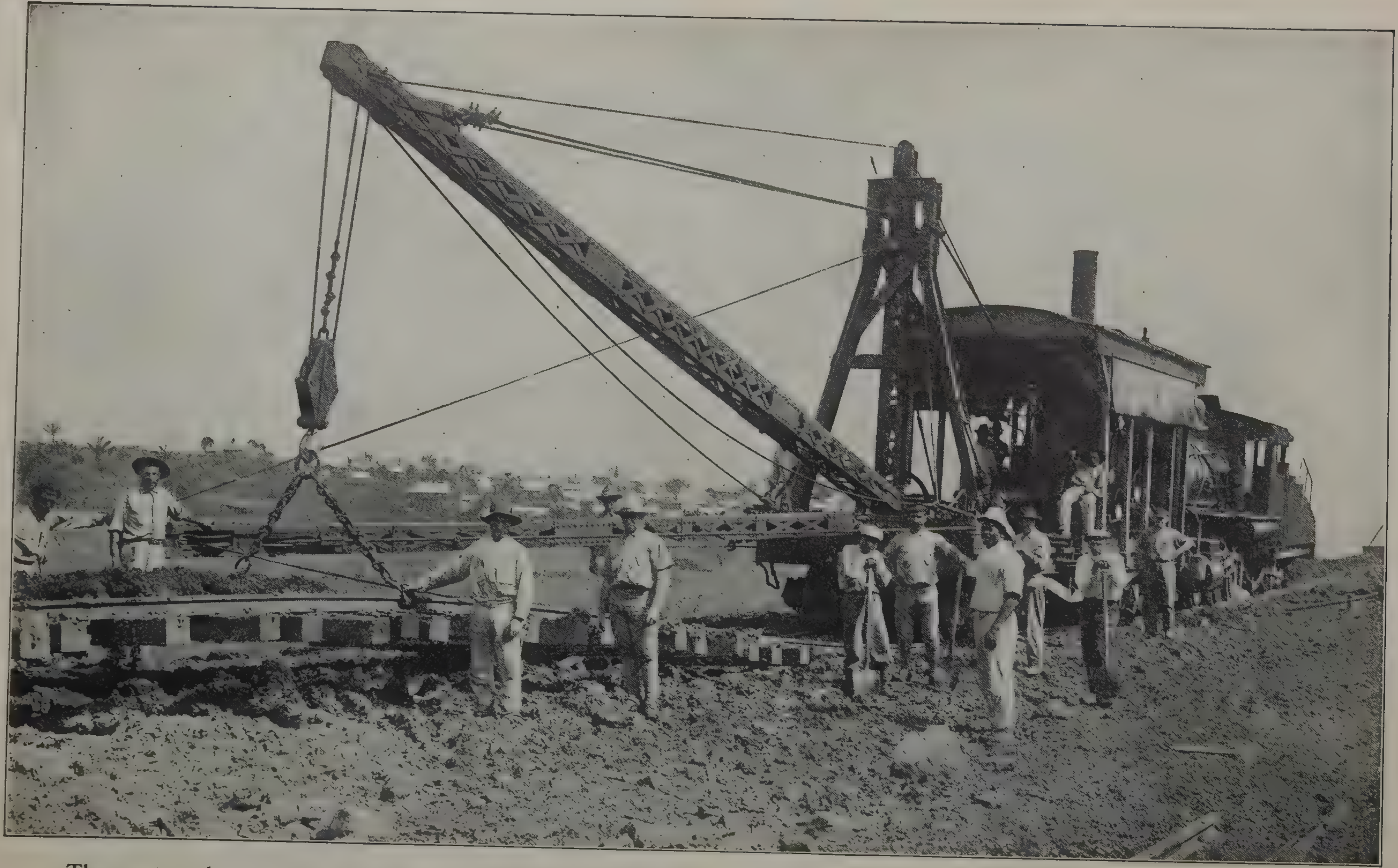
A great many difficulties have been encountered and overcome in building the Canal. The greatest difficulty in the excavating, was due to slides and breaks, which closed the drainage ditches, upset the steam shovels, and covered the tracks. The water that was not carried off by the diversion channels, entered the Cut, necessitating pumping.



General view of engine house and yard at Paraiso in 1906. This yard was dismantled several years ago, and yards were established at Pedro Miguel and Las Cascadas.



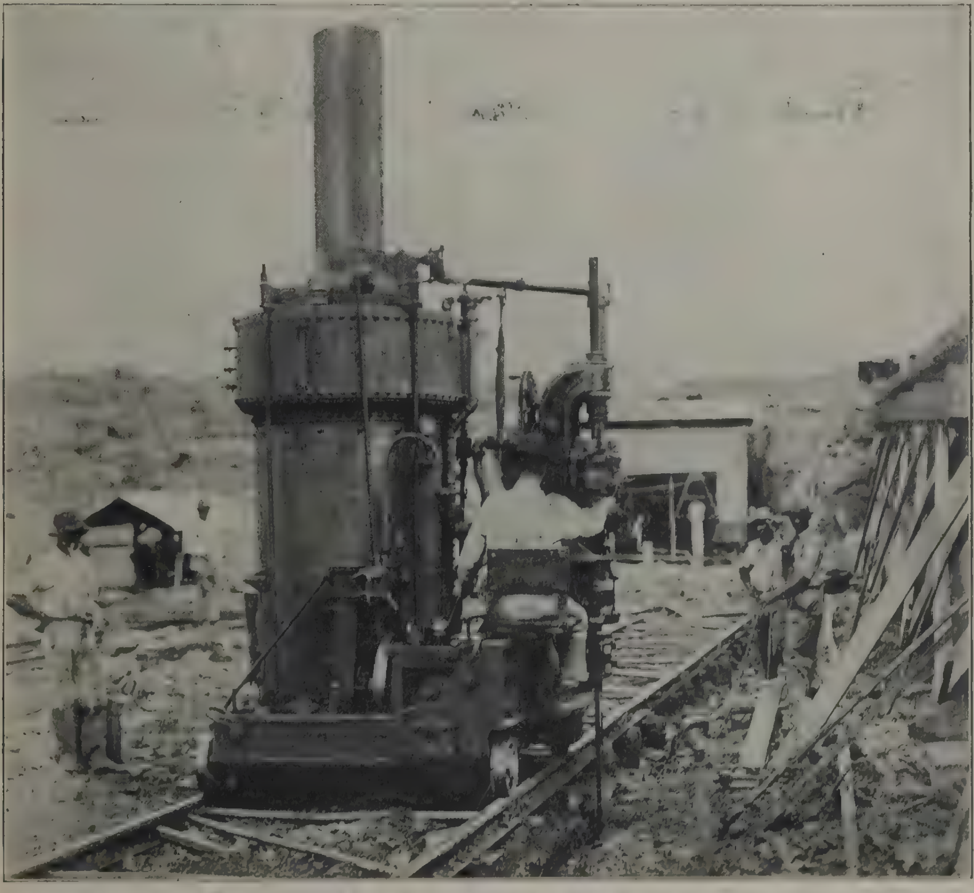
Engine house and yard at Las Cascadas. A very busy scene was presented in the morning when a hundred or more of the engines were leaving the yard to begin their daily work of pulling dirt trains out of the Cut to the dumping grounds.



The most modern machinery that brains could invent, or money buy, has been used on the Canal work. In many cases the practical knowledge of the Canal engineers has been applied to various machines after purchase, with the result that a higher degree of efficiency has been obtained from them than their manufacturers guaranteed. Among the several inventions induced by the Canal work, is the track shifting machine, shown above, which lifts a section of the track, including the ties, with one motion, and by another, throws it from three to nine feet to one side. This machine does the work of several hundred men.

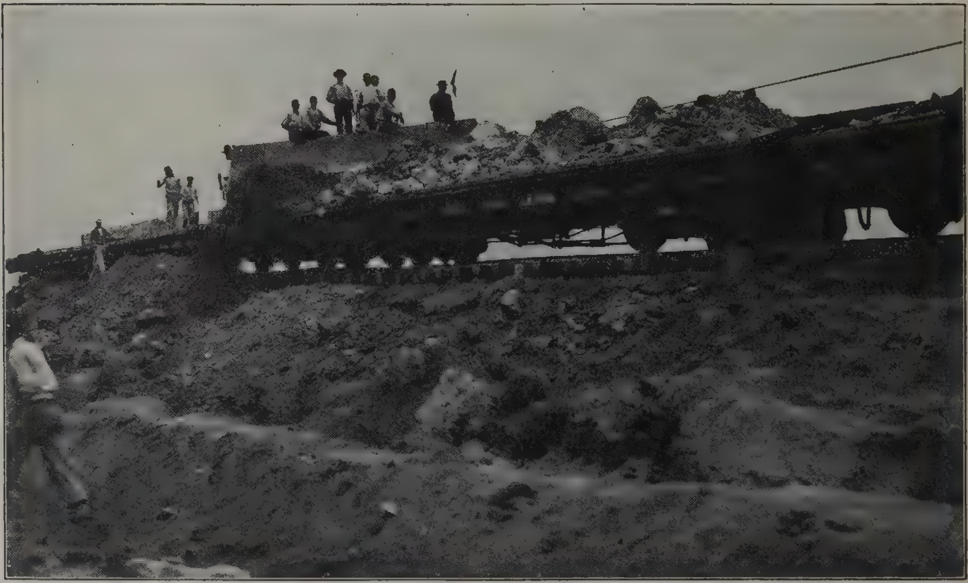
Men shifting track. The old way before the track shifting machine was invented, and put into use.

Revolving steam shovel. A few of these machines were used to advantage, but larger ones were used for the heavy work.

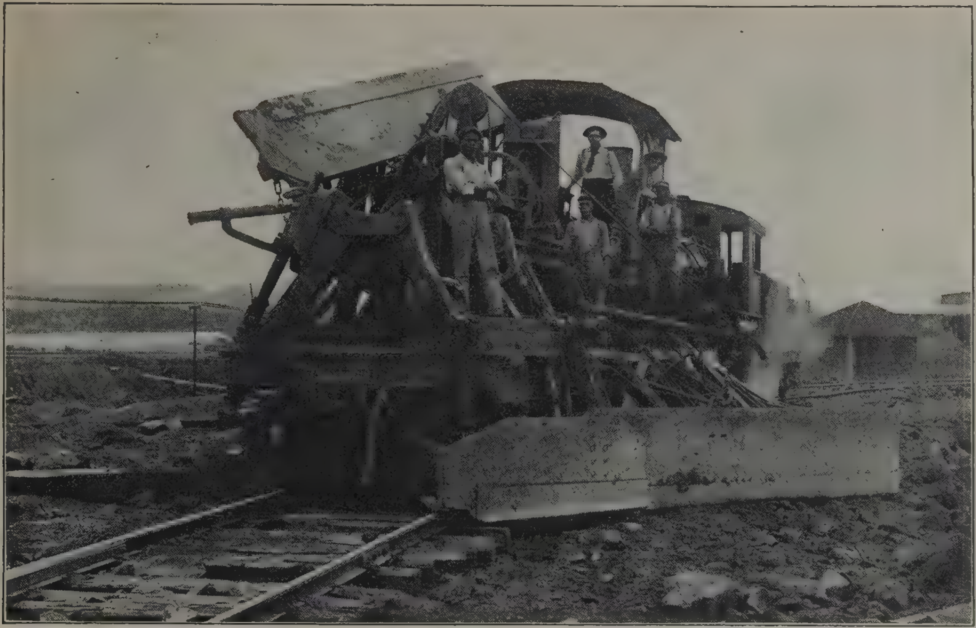


Rock channeler at work. These machines were used in Pedro Miguel Lock, where the natural foundation was hard trap rock. They cut grooves into this rock to the required depth for the installation of the floor culverts, after which the material was blasted loose, the aim being not to disturb the rock between the culvert trenches. They were also used in the Canal near Bas Obispo where the excavation was through solid rock.

Excavated material is transported in several kinds of cars, one of which is the Western Dump Car, shown in the picture. In some of the cars, the body is held upright by a chain grip, which, when released, allows the body to tip, emptying the contents. Others are dumped by air.

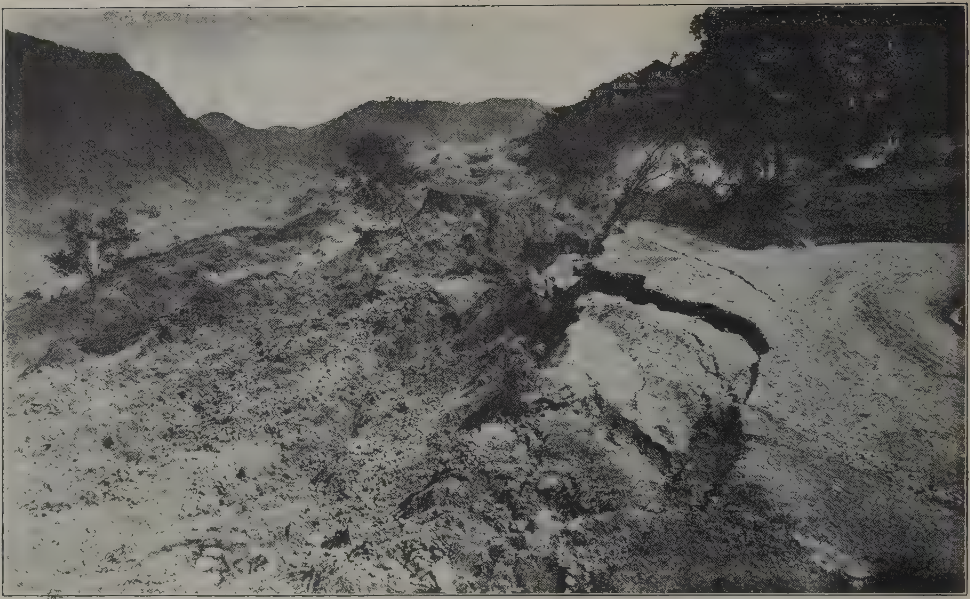


An unloading machine at work on a train of Lidgerwood flat cars. The unloader, actuated by steam from the locomotive, pulls the plow by a steel cable which coils around a drum. A man rides the plow, and signals the movements with a flag.

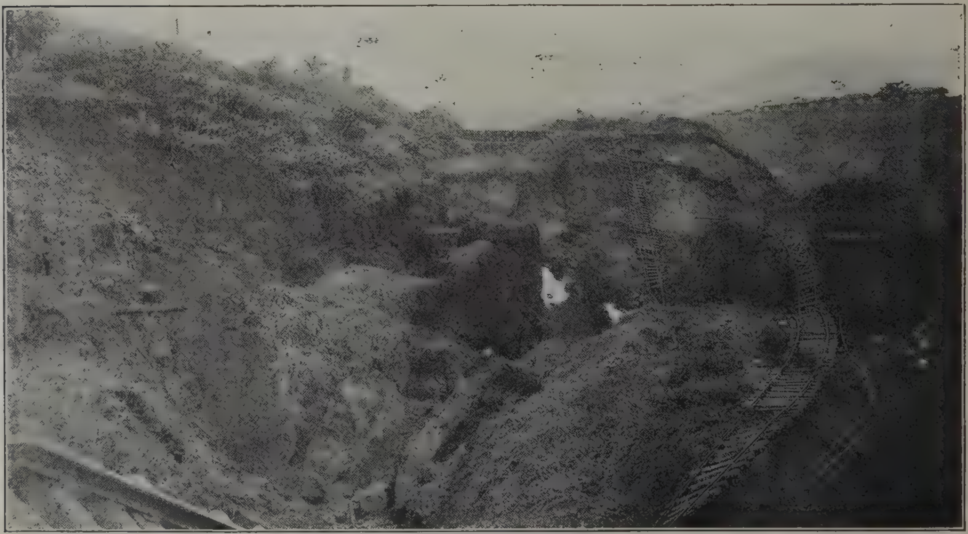


An earth spreader at work. After the cars have been unloaded, an earth spreader comes along and levels off the ground.

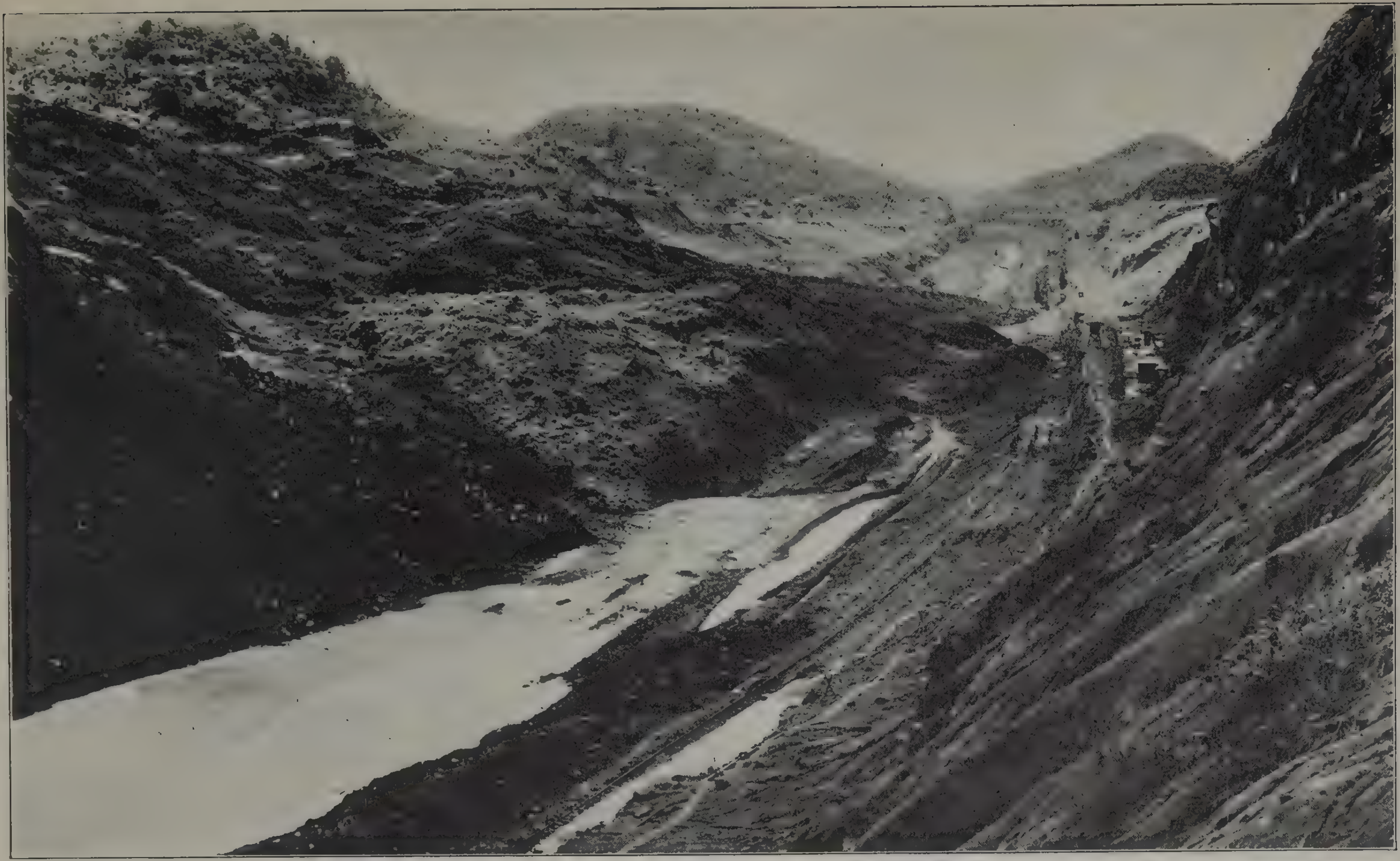
In order to dispose of the material from the Cut, large dumps had to be established. The site of this one, known as Miraflores dump, was formerly a swamp, but it has now been built up to a height of more than 40 feet. A large amount of the excavated material was used in building the Dam at Gatun and the Naos Island breakwater on the Pacific side. The spoil from Culebra Cut has been carried all the way from five to twenty-four miles.



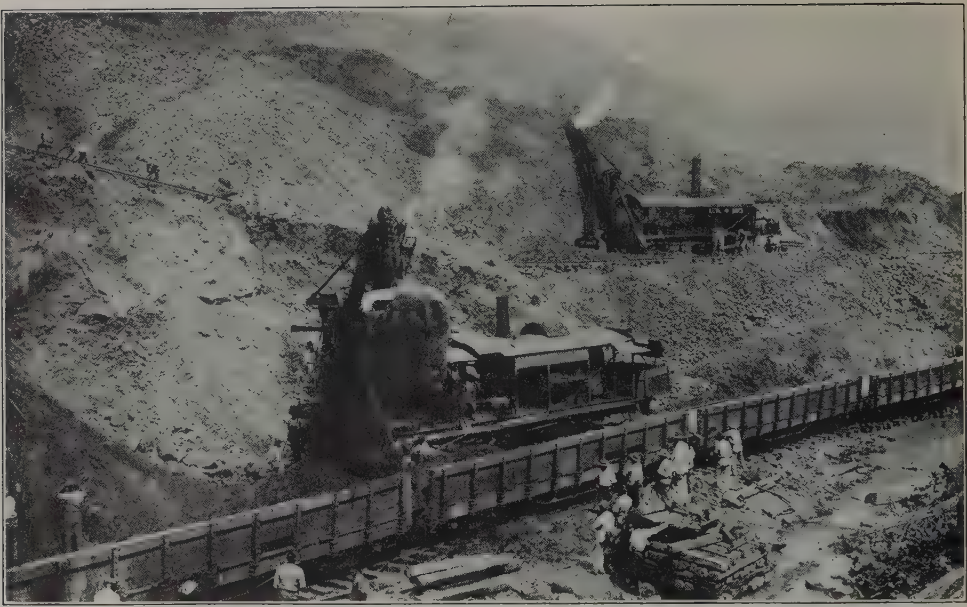
Many slides have developed during the latter part of the Canal work which have caused a great deal of damage and the excavation of much more material than was formerly estimated. This view shows a break on the west bank at Culebra which encroached on the village of Culebra to such an extent that it was necessary to move a large number of buildings, including the hotel and Y. M. C. A. Clubhouse.



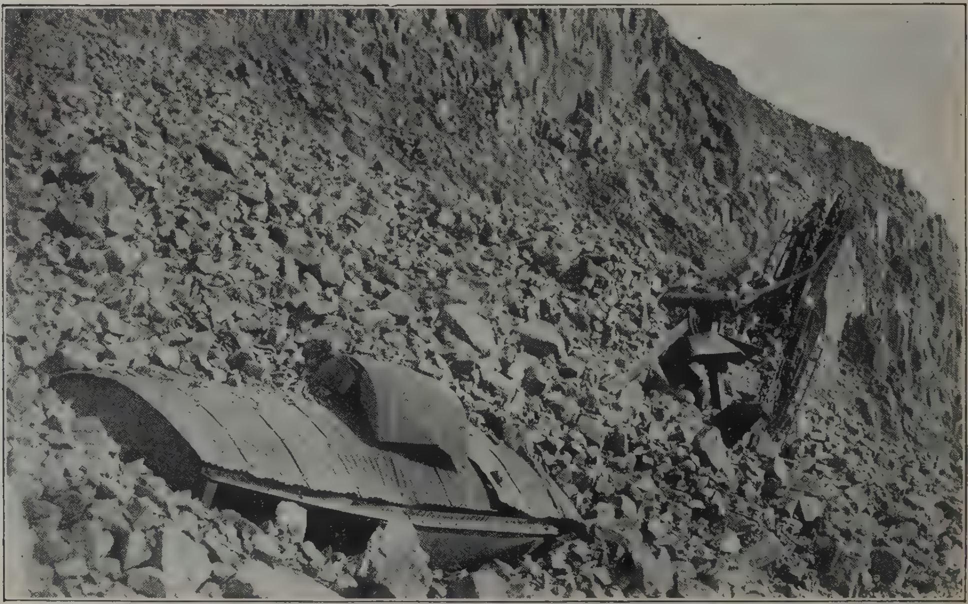
A break in the east bank of the Canal near Bas Obispo. This was caused by high water in the diversion channel, which broke through the separation wall, carrying into the Canal over 100,000 cubic yards of material, and flooding it for some distance. The disastrous effect on the railroad is clearly shown.



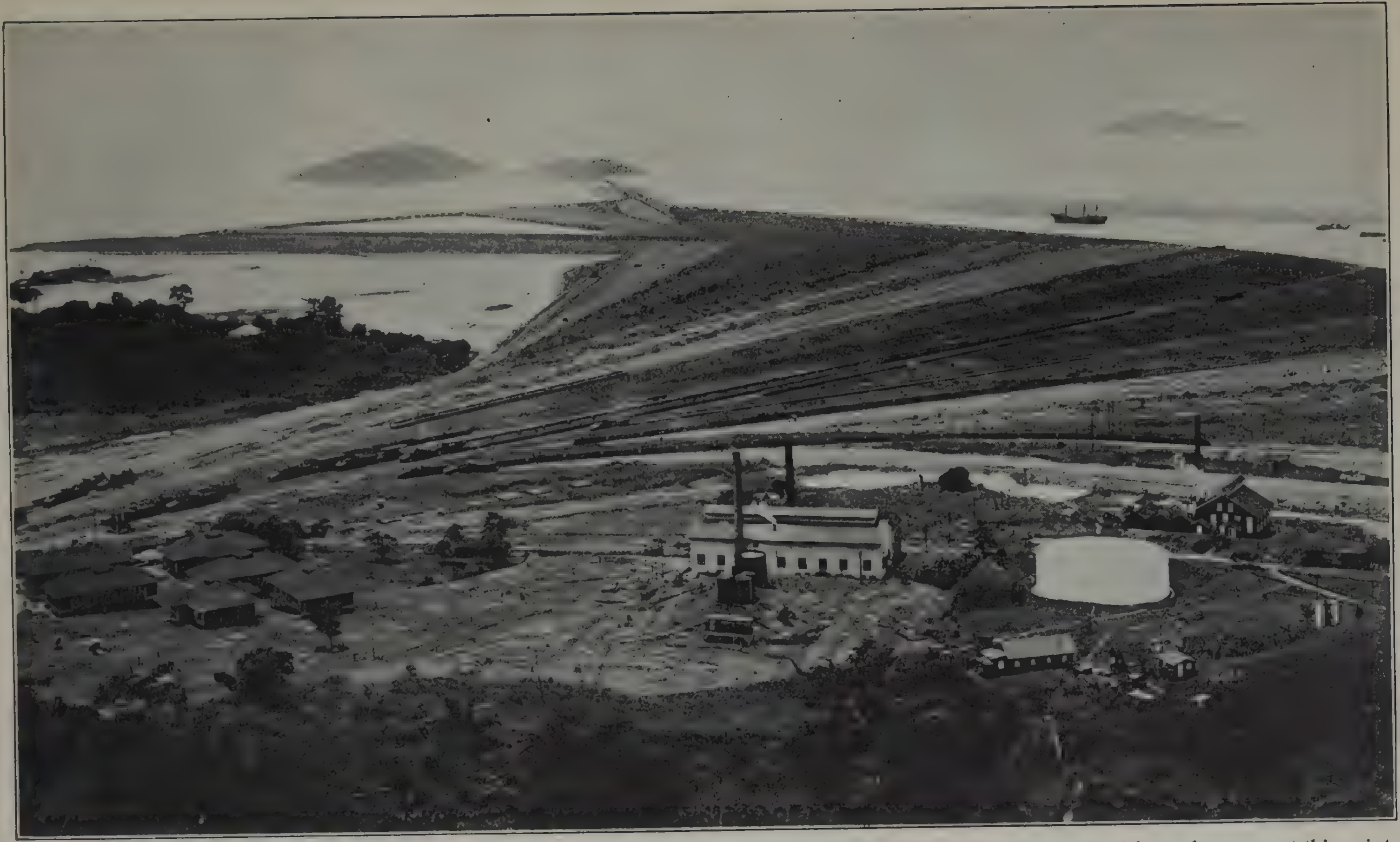
Cucaracha slide before the destruction of Gamboa dike. Some of these movements of material into the Cut are designated slides; others are called breaks. The one at Cucaracha typifies the normal or gravity slide.



Steam shovels working in the slide at Cucaracha. This slide showed evidence of activity as far back as 1887, when the French were at work on the Canal, and has been a source of trouble ever since.



This graphically portrays the result of a slide which has nearly buried a steam shovel. Colonel Gaillard, the Division Engineer, in charge of operations in Culebra Cut said: "I know of no single thing that has done so much to complicate the engineering problems of our work or to hinder and curtail the yardage output as the slides." Colonel George W. Goethals, Chairman and Chief Engineer, said: "The only way to overcome the slides is by unremitting excavation."



Naos Island breakwater, showing fill extending out from the mainland. A total of 474 acres had been reclaimed from the ocean at this point up to June, 1913. Practically all the material for the fill came from Culebra Cut. It is designed to cut off a cross current, which has carried a large amount of mud and silt into the Canal channel. In addition, it will serve as a causeway connecting the islands, and the fortifications thereon with the mainland.

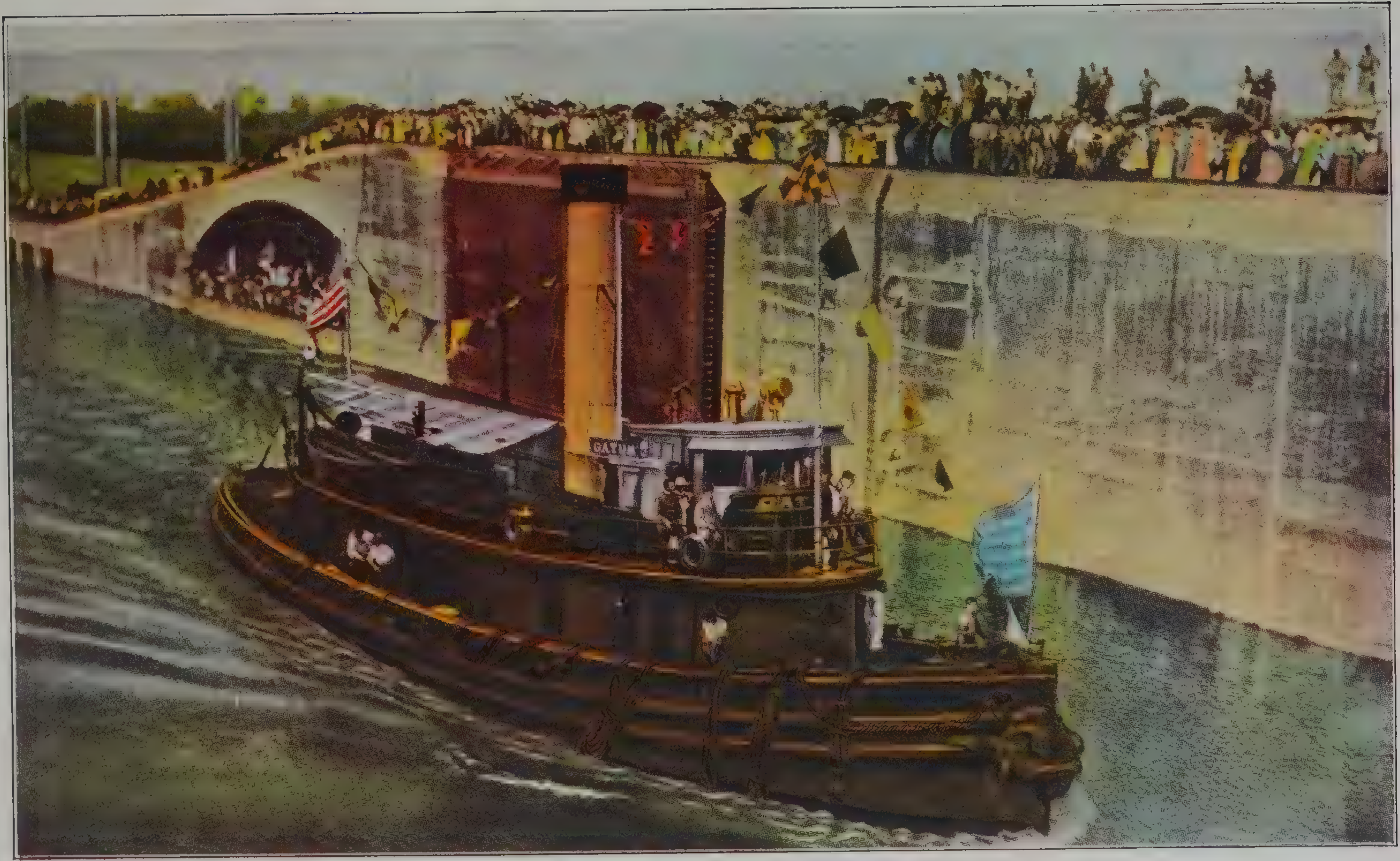
be of concrete construction. The Balboa townsite will be laid off in accordance with the most approved ideas, and with the view of making it a model town, including the beautification of its surroundings, as well as the grounds about the locks, the services of a landscape architect were engaged in July, 1913. The Commission of Fine Arts was delegated by Congress to supervise the permanent building work, and it has made suggestions from time to time.

Docks at Cristobal under construction. With the Canal practically completed, the attention of the Canal Commission is being concentrated on the permanent terminal facilities. The present plans include extensive plants at Balboa on the Pacific, and at Cristobal near the Atlantic entrance.

PERMANENT ORGANIZATION

The Act of Congress of August 24, 1912, provides for the appointment of a governor of the Panama Canal, when in the judgment of the President, the work of construction shall be sufficiently advanced toward completion as to render the further services of the Isthmian Canal Commission unnecessary. The appointment is to be made by the President, by and with the advice and consent of the Senate, and is effective for a period of four years. The salary is $10,000 per annum. President Taft, previous to the expiration of his term of office, allowed the fact to become public that he intended to dissolve the Commission and appoint a governor. Some Members of Congress opposed the plan, one declaring that it was not the purpose of the Act to abolish the Commission until it had completed its work. President Taft's term expired without any further move in this direction.

With the advent of the Democratic administration, it was the general opinion that President Wilson would give the matter thorough study before taking any steps toward abolishing the Commission. This has proved to be the case, and it seems to be the common understanding that the President has formed the opinion that the status of the Commission should remain unchanged until the great work is entirely finished and the Canal ready to be officially



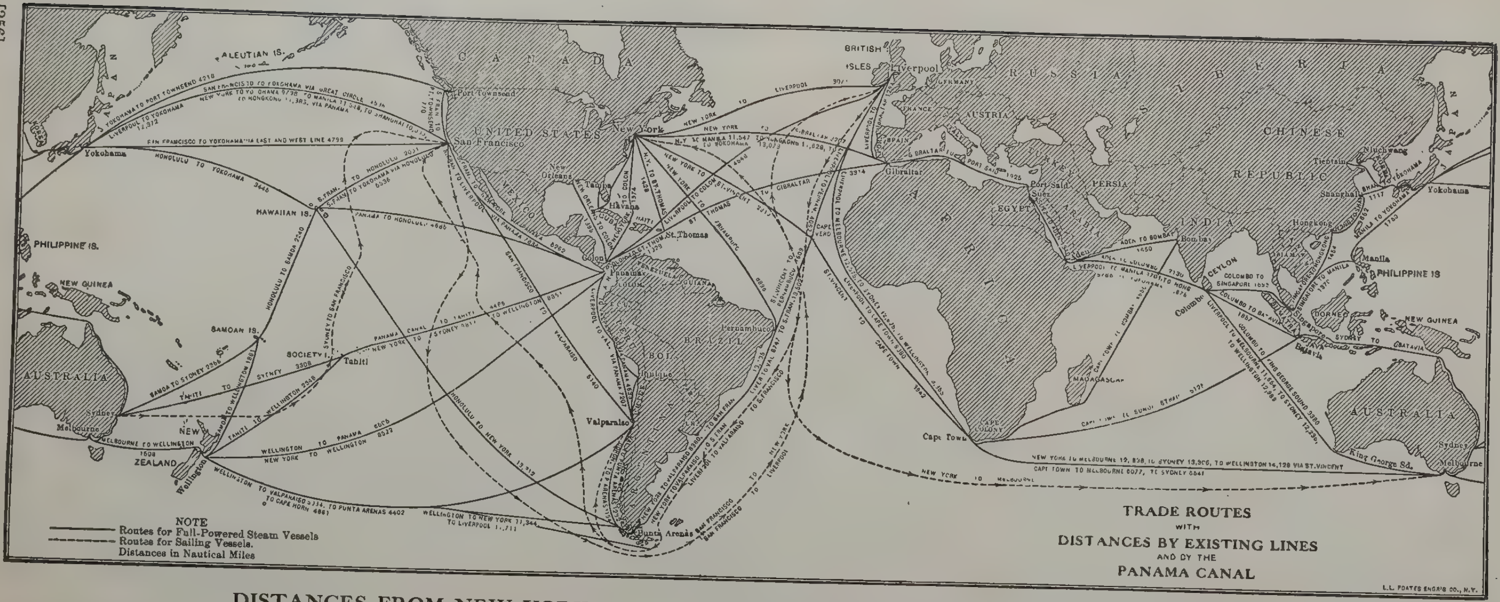
The preliminary object lesson in the Canal Zone Motto, "The Land Divided, the World United," finds its culmination in the striking illustration given above. The scene shows the first boat to pass through the Gatun locks on September 26, 1913, and pictures the enthusiastic throng of people who are manifesting their joy by cheers as the boat's progress is proceeding through the waterway. To the tugboat "Gatun" was accorded the privilege of making the first passage.

FUTURE CANAL TRAFFIC

THE volume of traffic that will pass through the Panama Canal after it has been thrown open to commerce of the world is largely a matter of speculation. The importance of the new waterway from a military standpoint is easily recognizable, and in the minds of American Army and Navy experts, the probable fact that the efficiency of Uncle Sam's Navy will be about doubled, alone warrants the enormous cost which the project has entailed. In commercial circles, however, the question of the hour is "Can the Canal be made to pay?"

To ascertain the probable amount of tonnage that will use the Canal during the next few years, the United States Government, on September 1, 1911, engaged the services of the highest American authority in this line, Dr. Emory R. Johnson, professor of transportation and commerce in the University of Pennsylvania. As special commissioner on traffic and tolls, Dr. Johnson has made an exhaustive investigation of the subject from all points of view, the results of which have been incorporated in a printed volume of 500 pages. His conclusions may be briefly summed up, as follows:

"The shipping using the Panama Canal annually during the first year or two of its operation, that is, in 1915 and 1916, will amount to about 10,500,000 tons. At the end of 10 years, the tonnage will doubtless have reached 17,000,000 tons. The prospect is, therefore, that the Panama Canal will start with less than half the tonnage which will then be making use of the Suez Canal. Moreover, it will be a long time before the Panama Canal catches up with the Suez waterway in volume of traffic. Should the Suez tonnage continue to increase at the present rate, the volume of shipping served by the Suez route in 1925 will be double that passing through the Panama Canal. It is hardly probable that the Suez tonnage will increase at its present high rate, while it may well happen that the stimulating effect of the Panama Canal upon industry and trade has been underestimated. Eventually, at the end of two or three decades, let us say, the traffic at Panama may equal or exceed that at Suez."

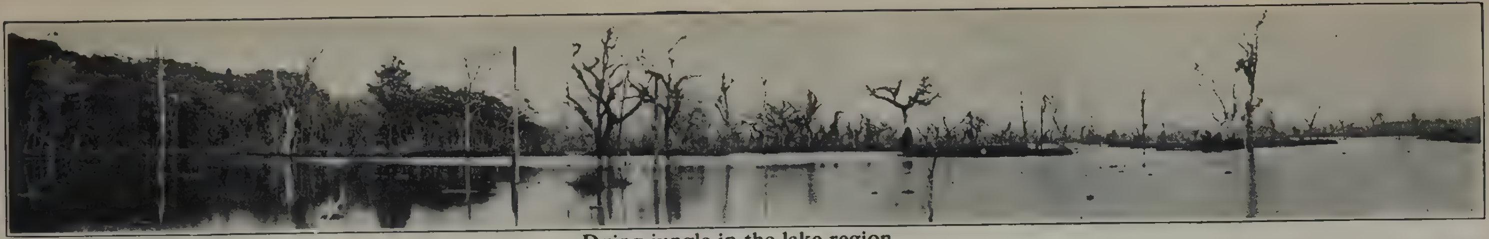


TRADE ROUTES
WITH
DISTANCES BY EXISTING LINES
AND BY THE
PANAMA CANAL

NOTE
Routes for Full-Powered Steam Vessels
Routes for Sailing Vessels.
Distances in Nautical Miles

DISTANCES FROM NEW YORK, NEW ORLEANS, AND LIVERPOOL TO VARIOUS PORTS.

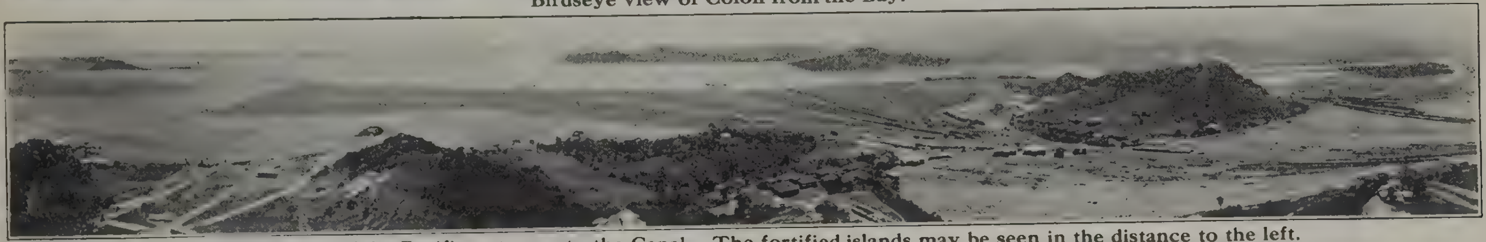
To	FROM NEW YORK			FROM NEW ORLEANS			FROM LIVERPOOL		
	Via Panama	Via Magellan	Via Suez	Via Panama	Via Magellan	Via Suez	Via Panama	Via Magellan	Via Suez
San Francisco...	5,262	13,135	....	4,683	13,551	....	7,836	13,502	....
Port Townsend .	6,032	13,905	....	5,453	14,321	....	8,606	14,272	....
Honolulu	6,702	13,312	....	6,123	13,728	....	9,276	13,679	....
Guayaquil	2,810	10,215	....	2,231	10,631	....	5,384	10,582	....
Callao.........	3,363	9,613	....	2,784	10,029	....	5,937	9,980	....
Valparaiso	4,633	8,380	....	4,054	8,796	....	7,207	8,747	....
Manila	11,548	....	11,547	10,808	....	12,947	13,961	....	9,701
Hongkong......	11,190	....	11,628	10,611	....	13,031	13,764	....	9,785
Yokohama......	9,798	....	13,079	9,098	....	14,924	12,251	....	11,678
Shanghai.......	10,645	....	12,384	10,070	....	13,833	13,274	....	10,637
Melbourne.. ...	9,945	....	13,009	9,813	....	....	12,574	13,219	11,654
Wellington	8,851	12,852	14,387	8,272	11,760	....	11,425	11,711	12,989
Bombay	14,982	....	8,186	....	....	....	17,610	....	6,226
Colombo	14,112	....	8,629	....	....	....	16,740	....	6,736
Singapore......	12,522	....	10,177	....	....	....	15,151	....	8,329



Dying jungle in the lake region.

The new Hotel Washington and grounds. Atlantic entrance to the Canal to the right.

Birdseye view of Colon from the Bay.



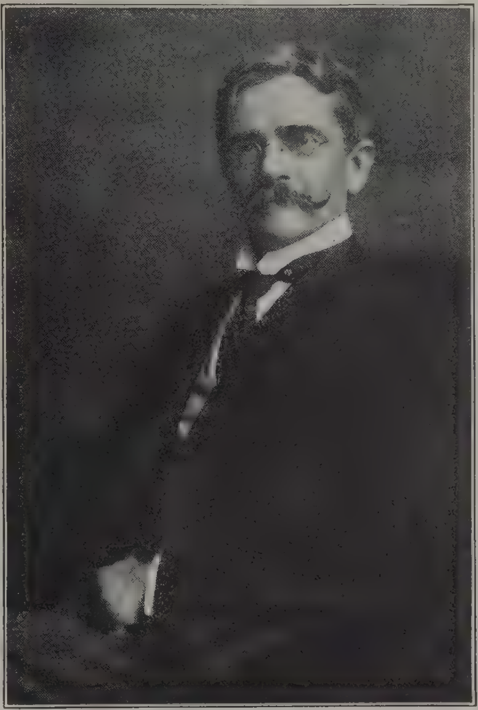
Birdseye view of the Pacific entrance to the Canal. The fortified islands may be seen in the distance to the left.

REPUBLIC of PANAMA

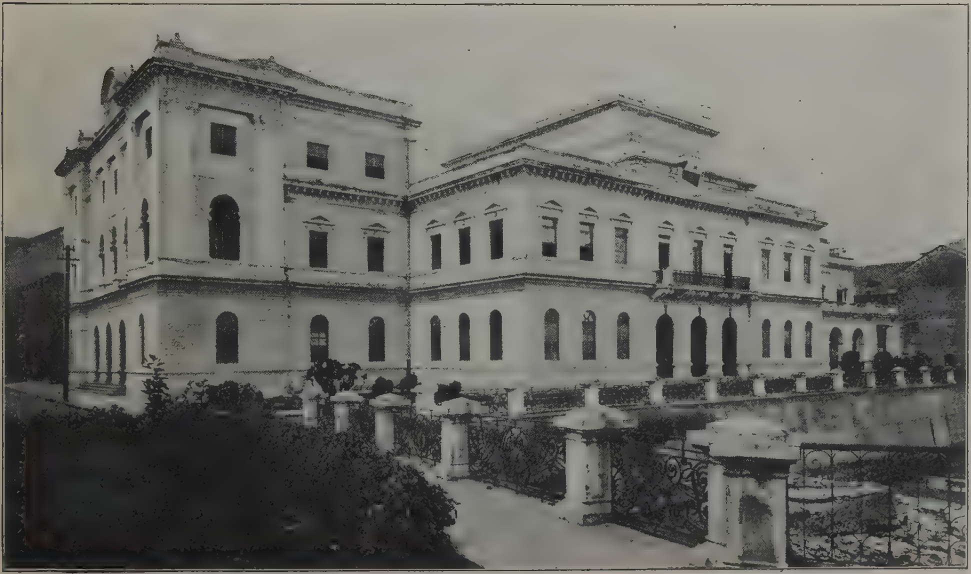
THE Panama of today affords a striking contrast to the Panama of yesterday. Although only a decade has elapsed since it became a republic and self-governing, the country has made a wonderful stride forward in progress and well-being. It cannot be supposed that this change would have been wrought so rapidly without the beneficent influence of its Northern mentor, for years of tyranny, of bickerings, of petty jealousies, and of political dictation generally leave an impress not easily eradicated. The Panama of revolutionary times when lust for power ruled, and when brother rose up against brother for no reason on earth save to depose an administration unpopular with some particular faction, is no more. Yet some of the older citizens sigh for the good old days, when, as the saying is "A revolution was born every minute." A newer generation is springing up, a generation that knows naught of war, and whose mission it will be to enter heartily into the arts of peace and husbandry, for the art of war is one from which Panama is forever divorced, and "Pro Mundo Beneficio" (For the benefit of the World), is its adopted motto for the future.

The history of Panama after the raids of the buccaneers is a history of countless revolutions, of plot and counterplot, of intolerable exactions on the part of the mother country, and of repeated attempts at independence. Like nearly all Latin-American countries, there were two main parties, Liberal and Conservative. When not welded together for the moment in indignant protest against some special act of injustice on the part of parent Colombia, these parties in Panama were continually fighting for control of such offices as Colombia permitted it to fill. A constitutional election was unknown up to a year ago, and victory at the polls was usually dependent on fraud, and by right of might. The Conservatives, who, in the past, represented the more prosperous element, generally held the reins of power, and instead of using this power for the good of all the people, treated their political opponents as personal enemies entitled to no consideration.

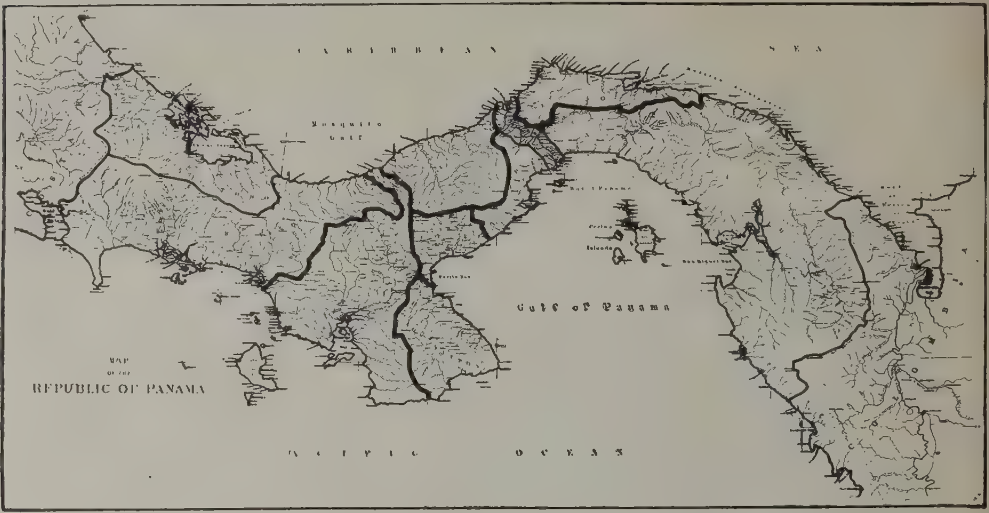
The revolution of 1900-1902, one of the most sanguinary struggles in which the Isthmian partisans ever became engaged, was started in Colombia, where the Jesuits, who constituted a dominant factor in affairs of church and state, had started a campaign against the Liberals. The fight involved every settled part of the Isthmus, and the failure of the local Liberal army to win victory at that time was due to the generosity of Gen. Emiliano Herrera, who laid siege to Panama City, and who, willing to give the women and children a chance to escape the bombardment, postponed his attack, thereby giving the enemy opportunity to strengthen its defenses. Dr. Belisario Porras, the present Chief Executive of Panama, was one of the principal Liberal leaders in this campaign.



DR. BELISARIO PORRAS,
President of the Republic of Panama.



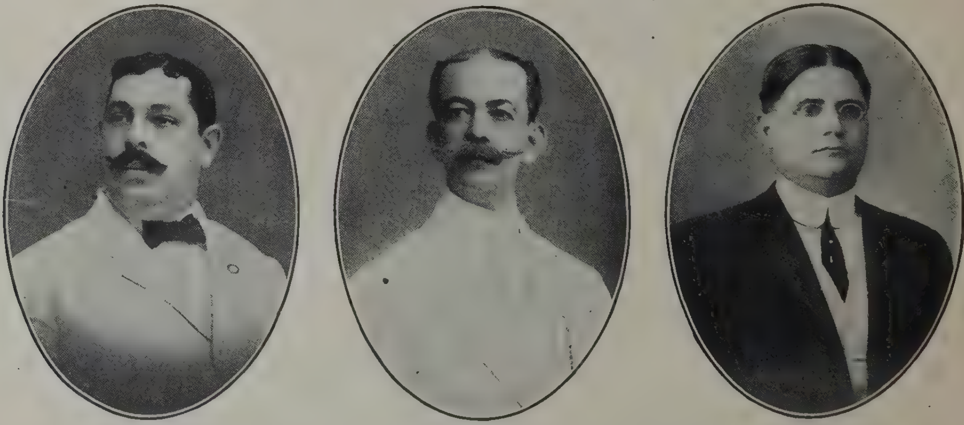
National Palace and Theatre, Panama City. It cost $1,000,000 and is the finest edifice in the Republic of Panama.



some rash act on the part of Panama, remote at best, will continue to be observed.

"THE LAND OF THE COCOANUT TREE"

Crook your finger slightly, and you will have a fair idea of the American Isthmus, practically the whole of which is included within the limits of the Republic of Panama. The area of the country can only be estimated, as no actual survey has ever been made; and is approximately 32,000 square miles, based upon the east and west boundaries, as claimed, for, to date, neither the frontier on the Costa Rica side, nor that bordering on Colombia, has been determined. The Panama-Costa Rican boundary question was submitted for arbitration to former President Loubet of France, but the Costa Rican govern-

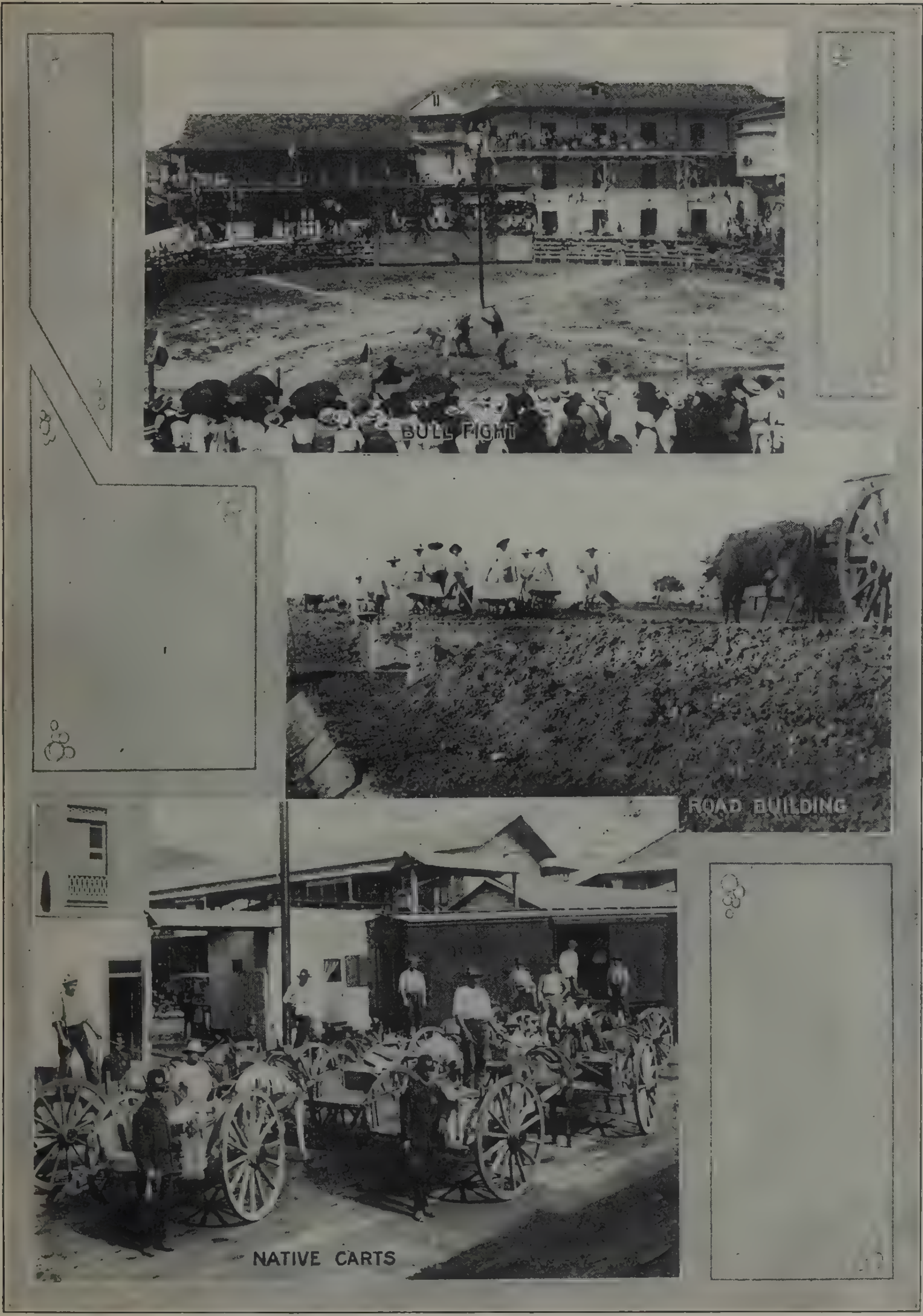


MEMBERS OF PRESIDENT PORRAS' CABINET.

DON GUILLERMO ANDREVE,
Secretary of Public Instruction.

DON RAMON F. ACEVEDO,
Secretary of Public Works.

DON ERNESTO T. LEFEVRE,
Secretary of Foreign Relations.



Bull fights are now prohibited, but cock fights are still a popular sport. Much money has been and is being spent in the building of fine macadamized roads. The street traffic in Panama City is largely carried on by means of two-wheeled carts drawn by one of the small native horses or mules. In this particular scene Panamanian silver money is being carted to the car to pay off laborers.

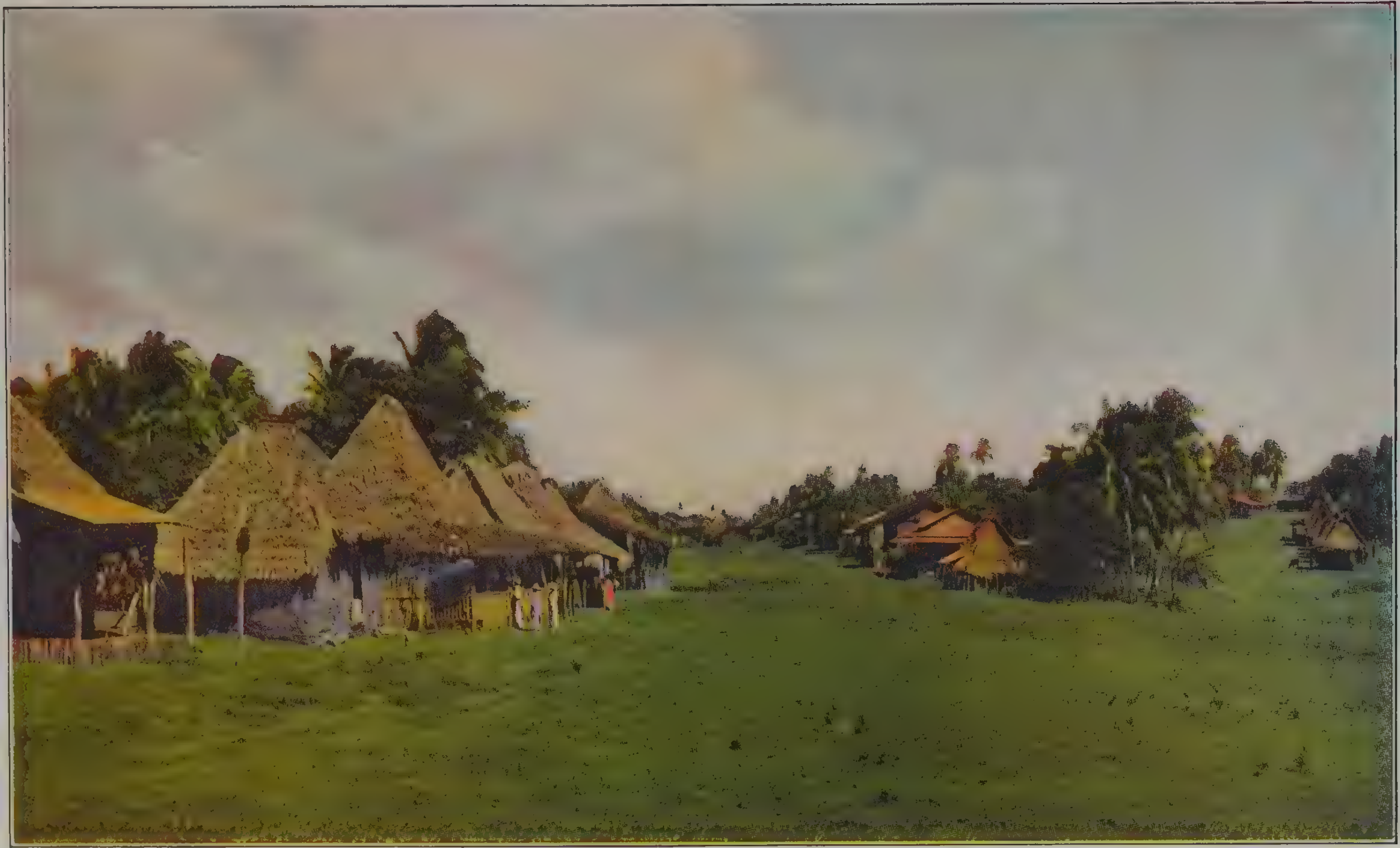
TAKING HOGS TO MARKET

TOBACCO PLANTATION

FARMING IN PANAMA

OX TEAM

Ancient methods of agriculture are still in vogue, such as planting corn by punching holes in the ground with a sharp pointed stick, although a few farmers have made homes and laid out plantations in the interior provinces and the methods of farming are being gradually improved. Produce is brought to market by a pack-pony or by two-wheeled ox carts over roads, which, in the rainy season, often become impassable.



A typical street scene in the native village at Chorera, Panama. On account of the mild climate, which prevails the entire year, the only protection needed is from the sun and torrential rains. The thatched roofs give ample protection to the natives who inhabit them.

WEST ENTRANCE of SAN DIEGO EXPOSITION

THE Panama-California Exposition, ground for which was first broken for work July 19, 1911, was formally opened at San Diego, January 1, 1915. Millions of lights flashed into life and cast a daylight radiance over the thronged grounds of the "Magic City of the Hill" as President Wilson, sitting in his White House bedroom three thousand miles away, promptly at 3:01 a. m., eastern time, pressed the button that officially opened San Diego's exposition for the 305 days of 1915.

The pleasant climate of San Diego and surrounding California makes it possible for the Exposition to run an entire year without interruption from cold.

The formal ceremony of throwing wide the gates of the Panama-California Exposition to the world began at 11:30 a. m., western time. Lyman J. Gage, former Secretary of the Treasury and now a resident of San Diego, presented Col. D. C. Collier, former president of the Exposition. After giving an account of the inception of the Exposition, Colonel Collier made way for President G. Aubrey Davison, to whom were delivered the plans, the keys, and finally the Exposition itself.

Though much smaller than many expositions of recent times—it covers only 614 acres in all—the San Diego Exposition presents an eye-filling picture.

All the Exposition structures except those on the "Isthmus," the Exposition midway, are of varying types of the Spanish colonial school of architecture.

On passing through the entrance arches, the California State building with its cathedral-like architecture and high tower attracts one's notice. Opposite is a Roman building which houses exhibits of ethnology and archeology from the Smithsonian Institute at Washington.

Eight other buildings, each an exact replica of some historic palace of Spain or Spanish America, with rounded arches and connecting colonnades, are to be found on the tree-lined prado. These main Exposition edifices are devoted to home economy, arts and crafts, science and education, foreign arts, botany, commerce and industry, varied industries and food products.

On the "Isthmus" are located the amusement concessions, comprising the largest roller coaster in the world, Anfalulu Land, the joy wheel, the centrifugal aeroplane, and other novelties.

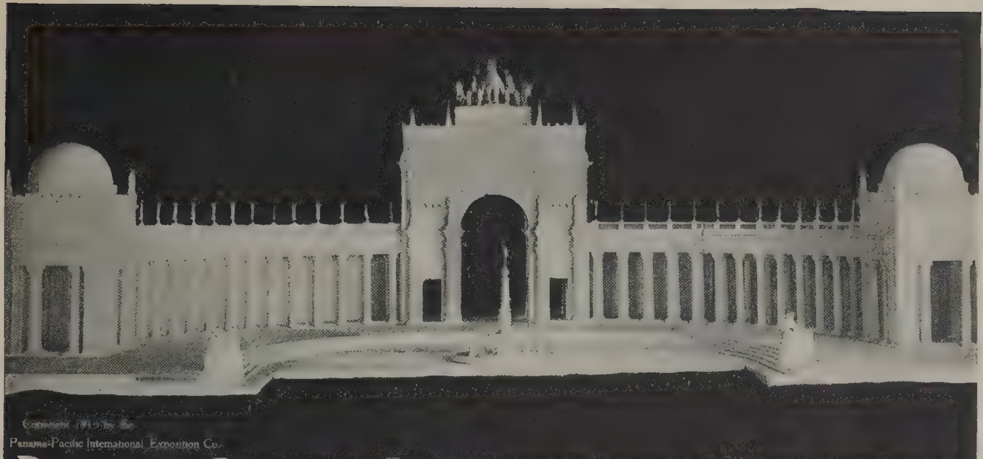
After San Diego had sent her invitations to the various states of the Union, and to foreign countries, and these had responded in so much greater number than was at first deemed possible, it was found necessary to greatly enlarge the scope of the Exposition. To this end the city has voted an additional $850,000 bond issue, making the third million dollars raised for Exposition purposes, by the city of San Diego alone.

As a matter of strict recognition and governmental approval, the San Diego Exposition is in exactly the same position as that at San Francisco; both expositions have been "recognized" by the Federal Congress, the invitations to each have been transmitted to foreign chancellories by the Department of State, and the customs and immigration laws are suspended by act of Congress, with the usual restrictions and bonding privileges granted in such cases.

Looking east along the Prado, San Diego Exposition.

The Smithsonian Institution and the National Museum have co-operated with the Division of Exhibits to secure exhibits of ethnology and archaeology from all over the world, and Congressman Kettner introduced a bill authorizing the departments of the government to place their exhibits here as well as at San Francisco. Enough exhibits have been secured to make good on all the promises of the Exposition, presenting a complete exposition of the history and achievement of the human race in America, including the great government department exhibits.

Food prices on the Exposition grounds are regulated by the management. The hotels of San Diego have agreed upon a fixed price schedule.



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PANAMA-PACIFIC INTERNATIONAL EXPOSITION

AT NOON on Saturday, February 20, 1915, the Panama-Pacific International Exposition was formally opened at San Francisco, as the official, national and international celebration of a great contemporaneous event—the opening of the Panama Canal, the history and construction of which are fully and faithfully described in the complete story of the great undertaking—eighth wonder of the world—which appears in this volume.

The opening of the Exposition was a glorious success. Five years of devoted work on the part of the promoters and builders ended in a distinguished triumph for all. For the first time in the history of world expositions, everything was ready on time—even the catalogue of exhibits was ready—and the splendid results were acclaimed by more than a quarter of a million people who thronged the grounds on the opening day. Thus the records of all previous national and international expositions held in the United States were completely eclipsed.

In the White House at Washington, President Wilson performed the act that set the machinery of the great Exposition in motion, and crowned the efforts of California patriots with national approval. Unique in this as in so many other respects, the Exposition was opened by wireless telegraphy. From a gold key in President Wilson's office, a wire led to the great government radio station at Tuckerton, from which the President's signal was flashed clear across the United States, caught up by antennæ stretched from the Tower of Jewels to the Column of Progress at the Exposition, and carried to a delicate galvanometer on the grand stand in front of the expectant multitude. This instrument in its turn tripped a relay that electrically started the huge Diesel engine in the Palace of Machinery, which immediately began to supply electric current to all the moving exhibits in the great hall. At the same moment the fountains began to play, the doors of the exhibit palaces were thrown open, flags rose everywhere as if by magic, and President Charles C. Moore formally declared the Exposition to be open to the world.

Official Parade in the Avenue of Palms on the Opening Day. Left to Right—Lieut. C. H. Woolworth, naval aide; William H. Crocker, exposition director; Secretary of the Interior Franklin K. Lane, President Wilson's official representative; R. B. Hale, exposition director; C. C. Moore, President of the Exposition; Capt. Edwin Carpenter, U. S. A.

Hon. Franklin K. Lane, Secretary of the Interior, himself a Californian, represented President Wilson at the opening ceremonies and paid an eloquent tribute to the American pioneer and to the courage and enterprise that had created "this new city by the Golden Gate." In his telegraphic report to President Wilson, Secretary Lane said:

"Two hundred and fifty thousand people at least had gathered for this moment. They waited in stillness and expectation for the flash of your wireless signal which opened the Exposition, and then broke into a triumphal cheer.

"It was not only one of the most spectacular, but one of the most impressive things I have ever seen. The fair itself is complete in all details. Exhibits are installed. Its architectural beauty has certainly never been excelled. I doubt if it has been equaled either in Europe or this country."

In his opening address, as Chairman of the day, President Moore said: "The wisdom of Congress in deciding that the great work of constructing the Panama Canal should be celebrated is obvious. Its wisdom in selecting California to act as host for the Nation is yet unproved, but we offer today an accounting of our stewardship and ask of our fellow-citizens the credit for conscientious earnestness, lofty ideals and high purpose. The pride that every citizen should, and does, feel in the completion of the Panama Canal has spurred us on for accomplishment. We have felt that bringing together here the best we could secure in this Nation and the world was none too good for the purposes of the great celebration in our charge. This work we have considered should be dedicated, by the very nature of the celebration, to contemporaneous achievement. Education, information, and human uplift have therefore been the prime factors that have moved us. In our architecture, color, landscape, lighting effects, statuary, music, and all branches of art, and the material things of life as well, we have striven to produce a result that would benefit every visitor that comes within the Exposition gates, mindful always that the event we celebrate warrants superlatively the best effort of all."

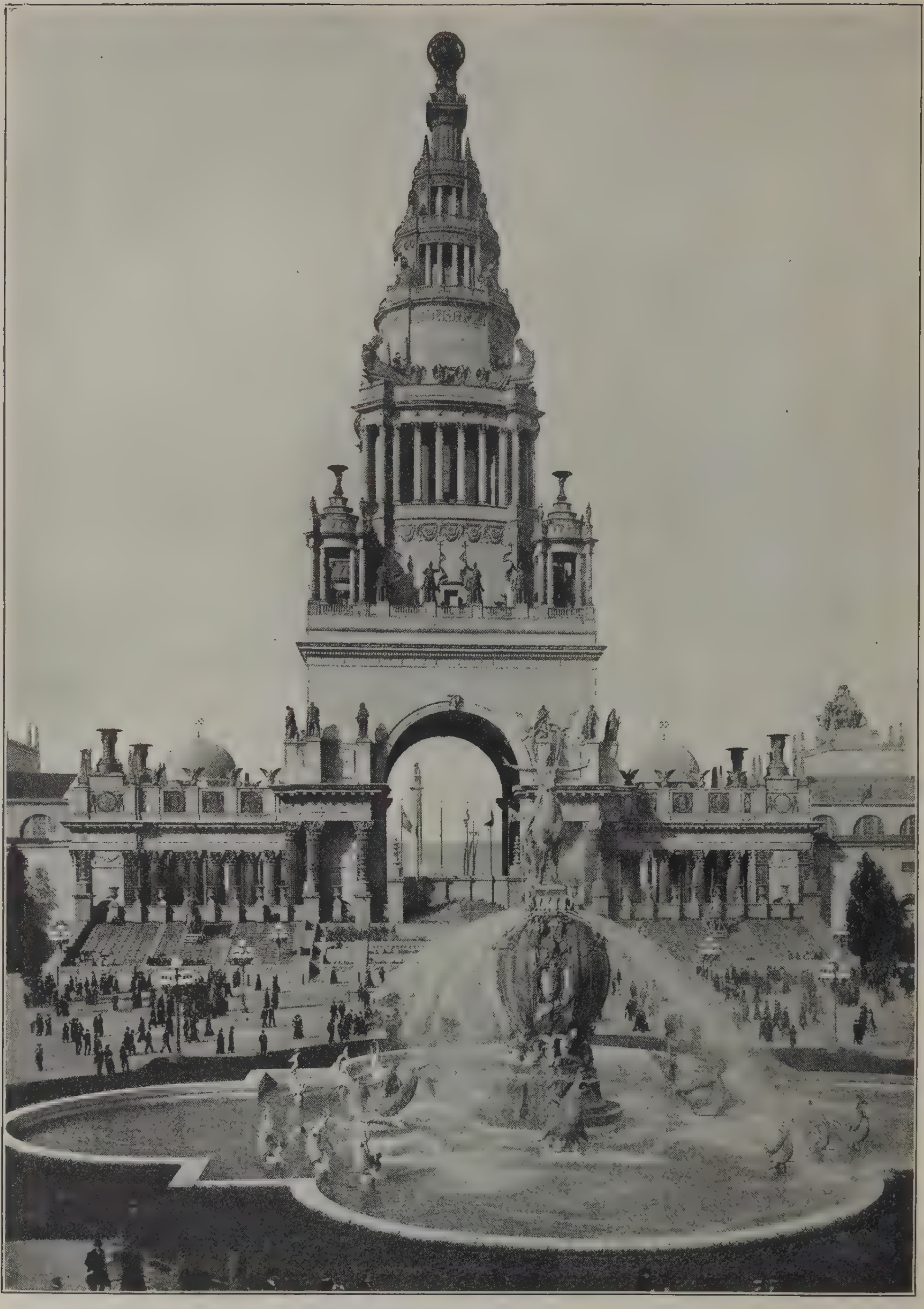
The opening ceremonies were preceded by a parade of directors, officials and visitors from the California building to the grand stand in front of the Tower of Jewels, and also by a public parade from the civic center of San Francisco, in which it was estimated that 150,000 persons participated.

Under these promising auspices the great celebration of the union of the oceans was fittingly begun.

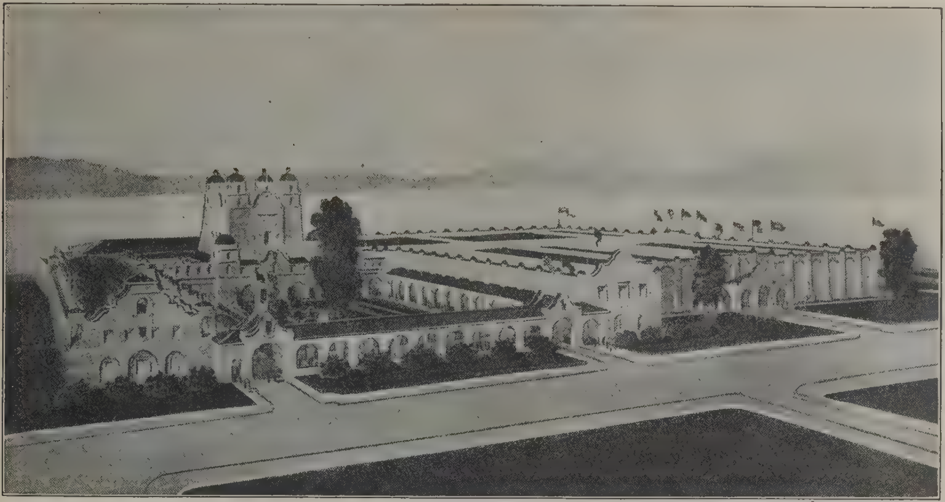
BRIEF HISTORY OF THE EXPOSITION

Even before its opening the Panama-Pacific International Exposition had already shattered many world exposition records. Its history reflects the

The Grand Stand on Opening Day. President C. C. Moore receiving President Wilson's Message of Congratulation.



The Tower of Jewels, crowning architectural feature of the Exposition, with the Fountain of Energy in the foreground. The Tower was designed by Messrs. Carrere & Hastings of New York, rises to a height of 433 feet and fairly dominates the artistic groups of architecture that surround it. It is also called the Main Tower. Strikingly beautiful by day, its beauty is enhanced at night by the brilliant illumination of which it is the center. The "jewels" of the Tower (over 100,000 in number) are prisms of handcut glass, hung tremulously so that they flash and scintillate in ever-changing colors as they sway in the slightest breeze or respond to the rays of the sun or the searchlights.



California's great building—largest state building ever erected at an Exposition. Reminiscent of Mission architecture, with its patios and cloisters, it contains an immense ballroom, a great reception room, roof garden, and offices for the president of the Exposition. The great tower is 70 feet square and 120 feet high.

motive exhibit illustrates the latest types. The car exhibits show the modern development of street car equipment, and there is a complete showing of railway supplies, including all the new inventions and appliances for the protection of life and property in this connection.

Palace of Agriculture. The section of the Exposition devoted to the interests of agriculture embraces an area of more than forty acres. The Palace of Agriculture proper, covers seven and one-half acres. The exhibits deal with every phase of the agricultural industry. A very important group is devoted to farm implements and machinery. In this department also is shown all that pertains to forestry and forest products.

Palace of Agriculture (food products). Under this same department, although in a separate palace, the multiform exhibits governing the food products of the entire world have been grouped. Vegetable and animal food products and the equipment and methods employed in the preparation of foods and beverages are extensively shown.

Palace of Mines and Metallurgy. The exhibits in this palace deal with the natural mineral resources of the world, their exploration and exploitation, their conversion into metal, and their manufacture into structural forms and into raw material for the various industries. They take in the ordinary metals such as gold, silver, copper, lead, zinc, iron, aluminum, etc.; the rare metals such as tungsten, vanadium, uranium, radium, platinum, etc.; the non-metallic substances, such as clay, cement and their products; coal, oil and gas: the salines, fertilizers, etc. The object of the Mines and Metallurgy exhibit is twofold: first, to draw attention to the natural mineral resources of each country, state or community so that the public may learn of the mode of occurrence of the metals of commerce and their distribution, of the stage of development of the various districts, of present sources of supply and consumption and of possible future sources of supply and of extended markets; second, to educate the public in a general way regarding the details of the industry, its problems and its needs.

MISCELLANEOUS BUILDINGS

Live Stock Exhibit. In keeping with the general plan of the Exposition the Department of Live Stock has beenpresented in a better manner than has heretofore characterized such exhibitions. Competitions for the $175,000 in prize money appropriated by the Exposition, and for the supplemental premiums offered by the breeders' associations, are announced for the months of October and November. In addition to this is a continuous live stock display from February 20 to December 4, 1915. In housing, classification and arrangements of the exhibits, the Department of Live stock at San Francisco demonstrates the advancement that has been made since the last world exposition. Special events include universal polo, international cavalry contests, two harness horse racing meets, and the carrying on of a series of demonstrations intended to teach everything that is new in this important industry.

The Exposition Auditorium. This building, designed by Messrs. John Galen Howard, Frederick H. Meyer and John Reid, Jr., is a four-story structure of steel and stone and graces the civic center of San Francisco. It will be a lasting and beautiful monument to the Panama-Pacific International Exposition. The Exposition management paid over one million dollars for its erection and the City and County of San Francisco paid nearly a million dollars

Oregon's characteristic building, with columns of huge native logs.

THE COURTS AND THEIR BEAUTY

The Court of the Universe. Designed by Messrs. McKim, Mead & White, of New York, this is the great central court or court of honor of the Exposition, and in design and decoration it is made to represent the meeting place of the hemispheres. It is 700 feet long and 900 feet wide, and contains a sunken garden in the center. At the northern end, between the palaces of Agriculture and Transportation, is a great pool of water embellished with statuary and fountains.

The Court of Abundance. This is the east central court of the Exposition and in design shows the Oriental phase of the Spanish-Moorish type. This court is dedicated to music, dancing, acting and pageantry. Designed by Louis C. Mullgardt.

The Court of the Four Seasons. This is the west central court and one of the most beautiful sections of the Exposition. It is said that Hadrian's Villa, one of the historic Roman palaces, was the inspiration for this court. It is surrounded by a beautiful colonnade, in each of the four corners of which are niches containing statuary representing the four seasons. Designed by Henry Bacon, of New York.

The Court of Palms. Designed by George W. Kelham, of San Francisco. This is one of the two minor courts of the Exposition. Its entrance is from the great South Garden between two towers, each rising to a height of 200 feet and favoring in architecture the period of the Italian Renaissance. This court contains a showing of rare and beautiful palms.

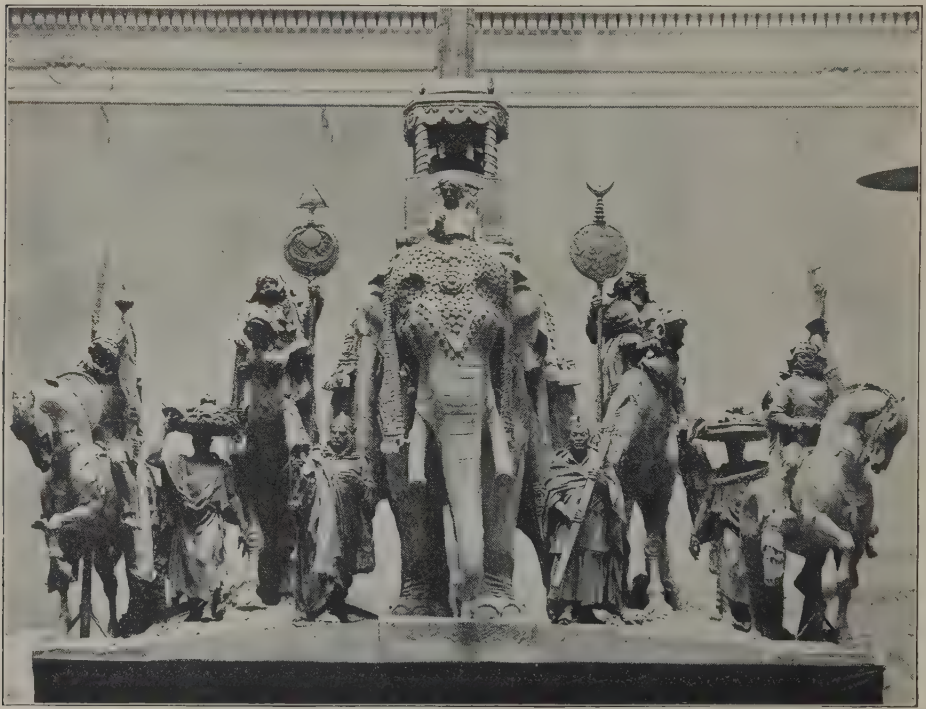
The Court of Flowers. This is the second of the minor courts, also having its entrance from the great South Garden between two Italian towers

Washington state building, another fine example of pavilion architecture.

The 4,000,000 square feet of roadways have been packed into smoothness and covered with resilient red rock which is easy on the feet and eliminates the glitter which tires the eyes. Hundreds of trees have been transplanted into places along the drives and in the gardens. More than ten thousand quick growing vines spread their tendrils along the walls of the buildings and the fence enclosing the Exposition, and millions of blossoming flowers have been planted in the gardens and courts.

BEAUTIFUL NIGHT EFFECTS.

One of the most attractive and beautiful features of the great Exposition is the electrical illumination at night, which presents a scene that, once witnessed, will never be forgotten. By an entirely new system of flood lighting a soft, restful, yet perfect light pervades the courts, revealing in wonderful clearness the facades and walls of the palaces and the natural colors of the shrubbery and flowers. By peculiar and novel lighting devices the statuary and mural paintings are made to appear with even heightened effect. Concealed batteries project powerful yet softened rays of light that cause tens of thousands of specially prepared glass "jewels," hung tremulously upon the towers, to flash and scintillate like great diamonds, emeralds and rubies. At a point on the Bay shore there has been erected apparatus that weaves in the night sky auroras of ever-changing color. There is a Scintillator composed of a battery of forty-eight 36-inch searchlight projectors with a beam candle power of 2,000,000,000. This powerful light plays on the cloudbanks that come in from the Bay.



"The Nations of the East," symbolizing life in the Orient and surmounting the Triumphal Arch leading to the Court of Abundance.

shows the various stages in arriving at the great superdreadnaughts that are in the midst of a titanic struggle in the present war.

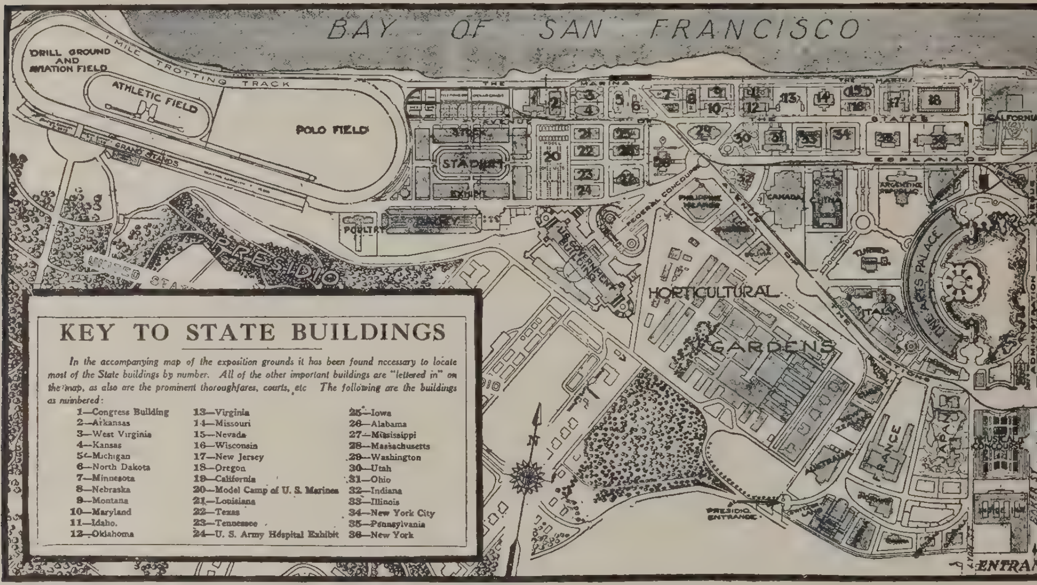
"The '49 Camp" is of great interest to all those whose friends or relatives came to the west during the gold rush of 1849 and to those who have read or heard the wonderful stories of those days. The types of those days are reproduced in the men that are to be seen around the 1915 mining camp, the reproductions being as true as historian's can make them.

"Panama Canal" concession, and crowd in "The Zone" or amusement district.

"The Panama Canal" is one of the first large attractions to greet the eye of the visitor on entering "The Zone." This will be one of the greatest educational features of the entire Exposition, for those who have not made the trip through the real canal may examine a miniature canal that is complete to the smallest details. Every part of the present canal with cities, locks, dams, spillways will be shown and the visitors will pass through from one ocean to the other in a palatial steamboat and the only difference between this trip and the real trip will be in the length of time consumed.

"Mahomet's Mountain" is one of the thrilling spots of the concessions district. It is a monumental pile of mystery and beauty. It is 150 feet high and 100 feet in diameter.

At the entrance is an escalator which carries the visitor to a mammoth cave of marvelous illusions. One may pass through a roaring waterfall and emerge perfectly dry. One may look into a deep well and see the center of the earth and



KEY TO STATE BUILDINGS

In the accompanying map of the exposition grounds it has been found necessary to locate most of the State buildings by number. All of the other important buildings are "lettered in" on the map, as also are the prominent thoroughfares, courts, etc The following are the buildings as numbered:

1—Congress Building
2—Arkansas
3—West Virginia
4—Kansas
5—Michigan
6—North Dakota
7—Minnesota
8—Nebraska
9—Montana
10—Maryland
11—Idaho.
12—Oklahoma
13—Virginia
14—Missouri
15—Nevada
16—Wisconsin
17—New Jersey
18—Oregon
19—California
20—Model Camp of U. S. Marines
21—Louisiana
22—Texas
23—Tennessee
24—U. S. Army Hospital Exhibit
25—Iowa
26—Alabama
27—Mississippi
28—Massachusetts
29—Washington
30—Utah
31—Ohio
32—Indiana
33—Illinois
34—New York City
35—Pennsylvania
36—New York

In "The Zone" there are many places to eat, such as cafeterias, dairy lunches and short-order places, and the prices asked are moderate. Meals may be obtained on the grounds at prices ranging from orders of cakes, coffee and syrup at fifteen cents to several dollars *à la carte* or *table d'hote*.

The lighting of the Zone is a tremendous glare, being of the old style "great white way" type, and, therefore, in marked contrast to the restful and subdued lighting scheme of the Exposition proper.

STATE AND FOREIGN BUILDINGS.

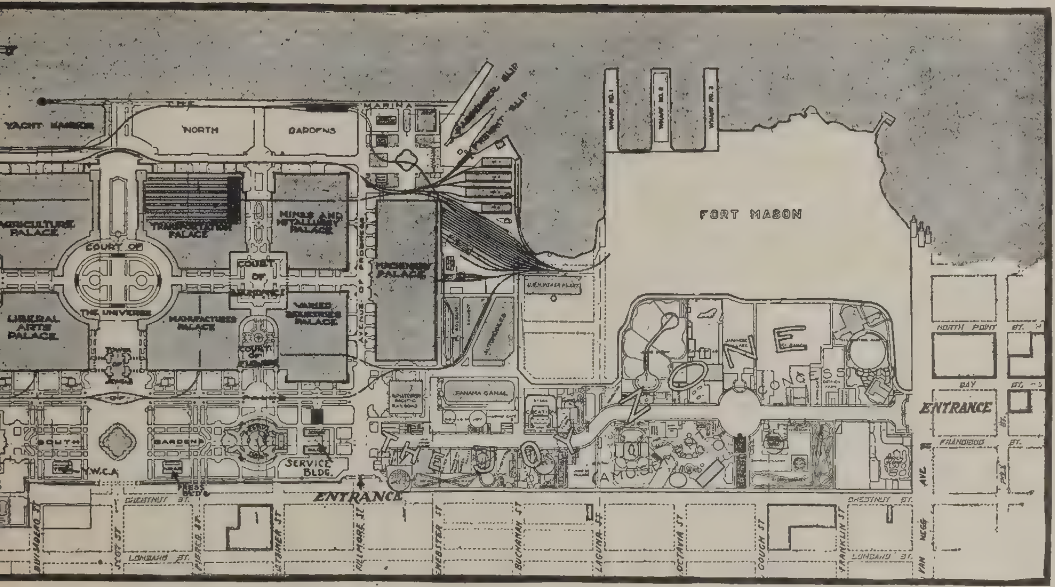
Whether from the greatest of old world capitals or the smallest of American villages, the visitor to the Exposition is sure to find a building that will have the home appeal and that can be made headquarters.

The New Jersey building is of special interest. It is a careful reproduction of Washington's headquarters—the famous Trenton Barracks—just after the crossing of the Delaware and the memorable surprise of the Hessians.

Of the numerous state and foreign structures there are many that stand out with peculiar appeal. Denmark, China, Turkey, Hawaii, Cuba, Japan, Virginia, New York, Oregon, California and the Philippines are a few that are of unusual attractiveness.

Chinese workmen, admitted to the Exposition grounds direct from China by special act of Congress, have erected a marvelous pavilion that represents the world's newest republic. It presents an exact duplicate of one of the famous palaces of the Forbidden City.

The castle of Hamlet, Prince of Denmark, is reproduced on a smaller scale in the pavilion erected by Denmark. The castle in reality is Kronborg Castle at Elsinore. Flanking the main entrance are duplicates of the old tombstones of King Gorm the Old and Queen Thyre, "Denmark's Mender," and each tombstone bears the quaint historical inscriptions that can be read today on the originals. The Lurs prehistorical musical instruments have a prominent place and a fanfare is blown on them at regular intervals by Danish musicians.



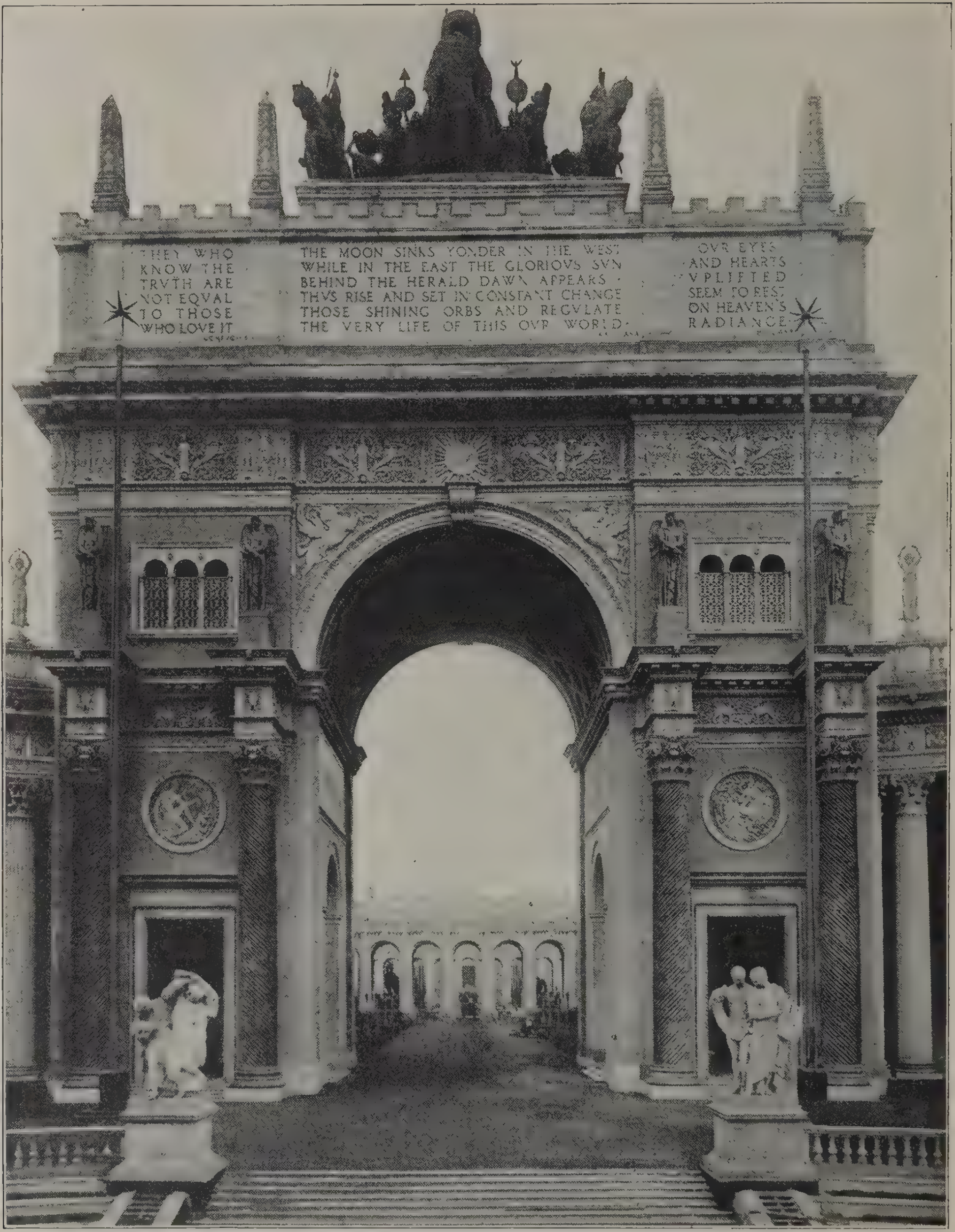
The historical value of the pavilion is enhanced further by the "Danskerhallen," the celebrated chamber which is placed in the basement. In this room the Flatey-Book is reproduced by actual photographs, page for page, taken from the original. In this book are shown the Icelandic Sagas and the account of Leif Ericsson's discovery of America.

United States history is recalled by the Virginia building. This state, which has been known as the Mother of Presidents, shows Mount Vernon, the home of the first president. Not only is the building an exact reproduction of that famous structure, but the interior furnishings are those actually used by George Washington. Mrs. Nannie Randolph Heath, of Virginia, who acts as the Virginia hostess, has much of the Washington furniture in her possession and has loaned it to her state for use in the building.

Hawaii has a choice spot for the building that represents this little land of seductive beauty. The site is at the edge of the lagoon of the Palace of Fine Arts and is sequestered in the midst of low-hanging trees. The architecture of the building follows the low-lying tropical type so common in Honolulu. The building is in the form of a cross and at the intersection of the two arms there is a rotunda containing a mezzanine gallery.

The main entrance is at the end of one of the wings of the cross and leads through a pergola into a tropical garden roofed with glass. At either side are the reception and waiting rooms and beyond the gardens is the rotunda. Across this rotunda is the pit, twenty feet in diameter, which contains a representation of one of the burning lakes of the volcano "Kilauea." In the angles between the wings radiating from the rotunda are four dioramas consisting of artificially illuminated scenes of typical spots in Hawaii. The aquarium is equipped with tanks containing the rarest and most beautiful fish of the Pacific Ocean. Music in this building is provided by Hawaiian singers and musicians.

Japan's pavilion is placed in a wonderful Japanese garden and both building and garden were transported from Nippon. The pavilion copies an original


THEY WHO
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WHO LOVE IT
THE MOON SINKS YONDER IN THE WEST
WHILE IN THE EAST THE GLORIOVS SVN
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THVS RISE AND SET IN CONSTANT CHANGE
THOSE SHINING ORBS AND REGVLATE
THE VERY LIFE OF THIS OVR WORLD
OVR EYES
AND HEARTS
VPLIFTED
SEEM TO REST
ON HEAVEN'S
RADIANCE

A rear view of the great triumphal "Arch of the Rising Sun," surmounted by the symbolical sculptured group, " The Nations of the East." The howdah upon the elephant rises 186 feet above the floor level of the Court of the Universe. Both this arch and its companion, the "Arch of the Setting Sun," are larger than the famous Arc de Triomphe in Paris.

a meeting room for the board, an oval reception room for women and eighteen private baths.

The ceiling of the ballroom cost $10,000 and the room is 54x76 feet with a balcony on two sides. On the first floor there is a music room, ladies' reception room, a ladies' writing room, and writing and reception rooms for men. A corridor runs the entire length of the building from east to west and the floor is of tile with the coat of arms of the state conspicuously interwrought. There is a large dining room, a private dining room and a kitchen with $3,000 worth of the latest culinary appliances.

Oregon's building, surrounded on three sides by the buildings of the states of California, New York and New Jersey, harks back to the Parthenon and also gives proper attention to the rich natural resources of the state. Instead of the marble pillars of the Parthenon the Oregon building uses giant logs with the bark intact. There are 16 of these great pillars on the north and south sides and ten on the east and west sides.

Every state and territory has been given one of these pillars. Every foot of the timber that has gone into this attractive building was sent from the Oregon forests and was sawed and planed in a temporary mill on the site. Another distinction that has come to Oregon is the giant flag pole with the ten foot star and 50 foot flag that marks the site. This pole is the tallest single piece flag pole in the world and was the gift of the citizens of Astoria, Oregon, and was cut from an Oregon fir tree.

Indiana is represented at the Exposition by a homelike Hoosier residence that will invite many more than Hoosiers. Inside is a library of more than 15,000 volumes, made up entirely of the works of Indiana authors. Other Indiana industries will be represented by the furnishing and outfitting, and the fireplace will be made of Bedford stone.

Two states have reproductions of their state capitols. Massachusetts has a duplicate of the state house at Boston and Ohio has reproduced the state capitol at Columbus.

Cuba brings atmosphere in its pavilion, which is of Spanish-American architecture. It is two stories in height with a tower at one corner. On three sides stretch the wide veranda common to Cuban haciendas and in the center of the building is a large glass-covered patio filled with Cuban plants and flowers.

The distinction of being the first foreign pavilion completed went to Honduras and the first state building to be ready was that of Idaho, which was dedicated on May 14, 1914.

Washington, North Dakota, Wisconsin, Kansas, Illinois, Pennsylvania, Nevada, West Virginia, and Colorado have buildings that reflect credit on those states. Canada has a fine building. Argentina, with the largest appropriation of any nation, $1,700,000, has a picturesque structure. Bolivia, Sweden, New Zealand, Australia and the Netherlands have pavilions of high artistic merit.

With its delightful location, its mammoth palaces, charming courts and vistas of unsurpassable beauty; its unique architecture and wealth of art treasures; its cosmopolitan group of domestic and foreign pavilions, and above all with its hundred thousand exhibits of the world's recent progress, the Panama-Pacific International Exposition will surely prove to be the world's greatest attraction until the closing day, December 4, 1915. The hospitality of California is famed over all the earth, and *"San Francisco invites the world."*

PANAMA CANAL
AND THE
GOLDEN GATE EXPOSITION
A GRAPHIC ILLUSTRATED DESCRIPTION OF THE
PANAMA-PACIFIC INTERNATIONAL EXPOSITION
Being the Official Celebration of the Completion of
AMERICA'S TRIUMPH AT PANAMA

By RALPH EMMETT AVERY, Noted Author and Lecturer
Edited by WILLIAM C. HASKINS, of the Canal Record

A Complete and Exhaustive History of the World's Greatest Waterway from its conception under French Promoters to its completion by the United States Government. *A Graphic Story of the building of this the Eighth Wonder of the World.* A Panorama of Photographs that Show the Transition of Old Panama with its Disease Breeding Swamps, its piles of rotting and rusting Engines, Cars and Dredges, into that of a *New Panama* with its *Completed Canal,* its *Ideal Harbors,* its *Wonderful Locks* and *Dams,* its *Awe-Inspiring Culebra Cut,* its up-to-date Homes and Schools that do credit to our Country, and with Climate and Sanitary Conditions that Proclaim it the Future Pleasure Resort of the Continent.

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and the
WORLD'S GREATEST CANAL

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